SOUTHERN POWER AND INDUSTRY

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JANUARY, 1954

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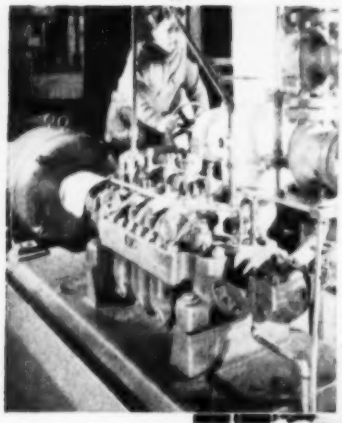
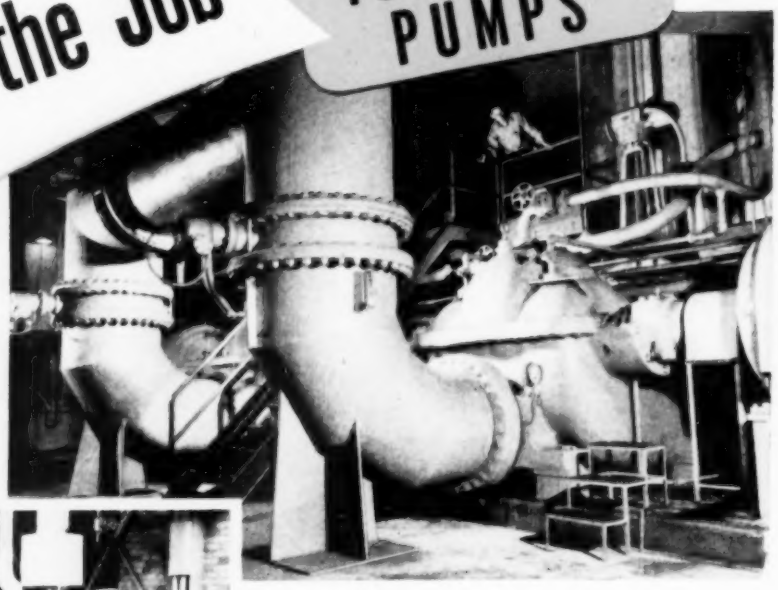
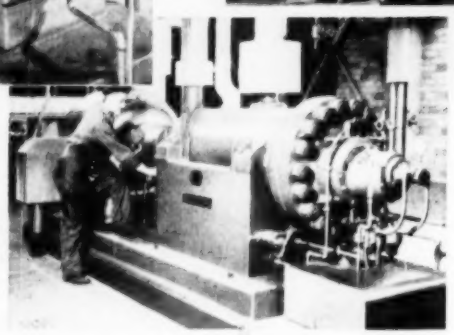
Engineered to Fit the Job

ALLIS-CHALMERS Power-Plant PUMPS

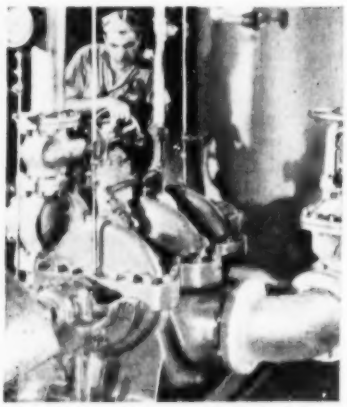




These double-suction centrifugal circulating water pumps are rated 35,000 gpm, 20-ft head. A-C also builds vertical axial and mixed flow types — providing a broad line that covers all installation requirements.



For boiler-feed service, Type M pumps provide heads up to 1200 psig. Barrel-type pumps offer high efficiencies in the pressure range of 1200 to 3000 psig, in ratings from 300 to 2500 gpm. Units shown are (above) 175 gpm, 1325-ft head and (right) 480 gpm, 4271-ft head.



Condensate pumps are designed and built for operating under vacuum and handling liquid at or near its boiling point. They are available in single and multi-stage types for vertical and horizontal mounting.

WHEN YOU TURN to Allis-Chalmers, you get triple insurance that each pump will fit your requirements:

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WRITE FOR *Bulletin 52B6059, listing Allis-Chalmers pump types and ratings.*

A-41418

ALLIS-CHALMERS

Milwaukee 1, Wisconsin

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Volume 72 Number 1

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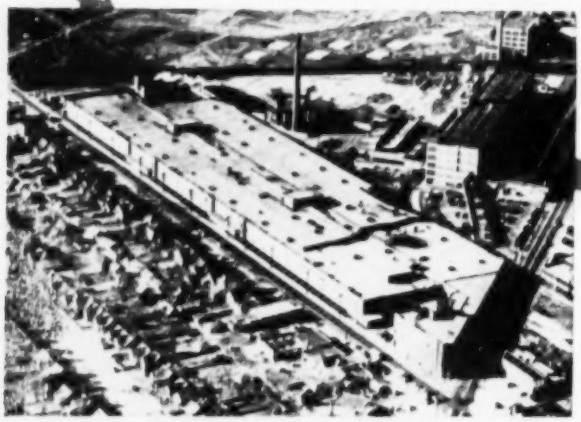
7 DETROIT STOKERS

in two *Eli Lilly and Company plants*



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High efficiency with low maintenance—ability to handle rapidly fluctuating loads, and cleanliness are Detroit Stoker features that appealed to Eli Lilly and Company engineers.

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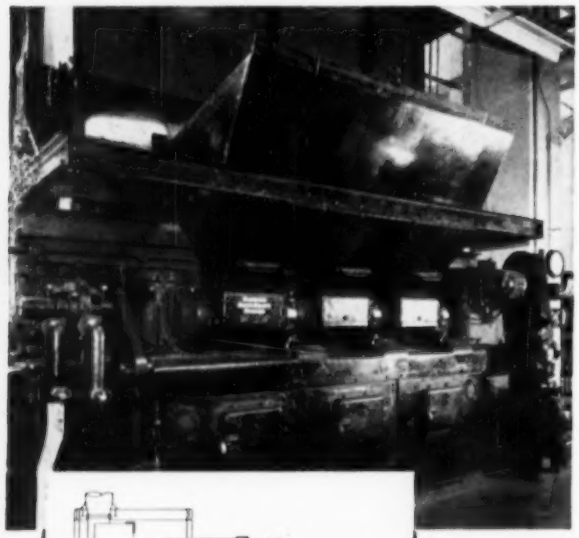
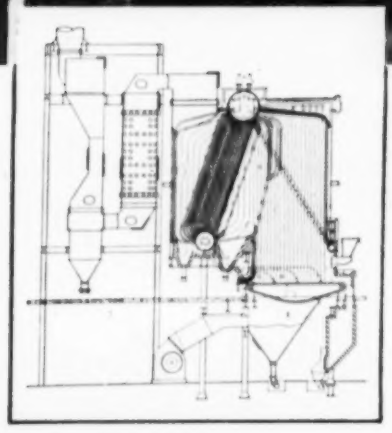
At the left one of the two Detroit RotoGrate Stokers at the Lilly Indianapolis plant. Capacity each Babcock and Wilcox unit 75,000 pounds per hour. RotoGrates also are in service at their new Tippecanoe Laboratories, Lafayette, Indiana.





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JANUARY 1954

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Facts and Trends

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

January, 1954

► FACTORY CONSTRUCTION TRENDS are evident in Worthington Corporation's new packaged cooling unit fabricating plant recently completed in Decatur, Alabama. New materials and methods employed by The Austin Company, designers and builders of the plant, paid off in speed and value.

Use of movable tilt-up concrete panels in a curtain wall; giant fiber insulation panels; and six air-conditioning platforms--raised into position in the truss area with fans, coils, filters already in place, helped construction engineers to have the 170,000 sq ft factory 95% complete in 123 working days. Worthington will fabricate 3, 5, and 15 ton packaged cooling units in their new Alabama plant.

► WASHING THEM DOWN . . WHILE HOT is a standard maintenance procedure at du Pont's Belle Plant near Charleston, West Virginia. As this chemical plant has a continuous process operation, the desirability of performing the necessary maintenance on energized lines is obvious.

Maintenance men maintain continuity of operations by washing cable terminals, bus supports, bushings, insulators, etc., on lines and substations up to 44 kv with a high-pressure water stream.

► CONDENSER SCALING PROBLEM in one of Southwestern Public Service Company's plants was solved by acid cleaning the entire cooling system while the three units were IN OPERATION. Method and results are reported in this issue.

As load conditions did not permit a loss of capacity, entire treatment was carried on at 20,000 kw load, requiring 3,800,000 gallons of well water, 36,000 lb of 66 F Baume sulfuric acid and 88 hours of skilled operators time.

► GAS CONVERSION problems and solutions at Cone Mills Corporation and the Cone Finishing Company in Greensboro, N. C., are featured in this issue. Conversion, rated at nearly half a million lb/hr, is the largest to date in the Piedmont Carolinas.

Company has five mills served from one central boiler plant. Use of this "one plant location" as a central metering point in the natural gas firing conversion, simplified the installation and kept the cost of service at a minimum.

Engineering problems included: (1) Conversion of four water tube boilers from pulverized coal to natural gas; burners and controls to be adaptable to the present boiler and other equipment already in use; (2) Equipment flexibility, so that conversion from one fuel to another could be accomplished whenever required, with a minimum of inconvenience; and (3) Installation of pressure regulation and metering equipment. Volume of gas required, 13,000 mcf per day, peak minimum monthly bill, 100,000 mcf.

(Continued on page 6)

"CHARTS"

Quick Solutions for Everyday Problems...

Specifically designed by SOUTHERN POWER AND INDUSTRY to serve the needs of Southern engineers, operating officials, department heads and maintenance foremen, "CHARTS" gives quick solutions for everyday problems. And now you can get a three-year subscription to S.P.I. PLUS a copy of "CHARTS" for only $4.00.

Note the wide range of subject matter:

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Company Position

Products Manufactured or Nature of Business

facts and trends (continued from page 4)

► TOPPING UNITS were used in the power plant addition in the $20 million Commercial Solvents Corporation's expansion at Sterlington, Louisiana. New units operate with the older 250 lb, 600 F plant.

New boilers and turbine generators are sized so that the entire boiler capacity can be put through the turbine, including extraction of any process steam needed beyond the flow through the low pressure unit. The $20 million expansion includes additions to the company's existing ammonia and methanol plants.

► WORRYING ABOUT EXHAUST FUMES from your motorized mechanical floor sweeper? An Oxy-Catalyst developed catalytic exhaust attachment being offered as optional equipment on all Parker Industrial motorized sweepers, reduces carbon monoxide to zero at both idling and governed speeds. This means that a motorized sweeper can be used safely in confined areas.

► MYSTERIOUS JARGON--Instrument engineers are having themselves a time with a language as baffling to the inexperienced as the jargon of the neuro-surgeon would be to a garage mechanic. Automation . . closed loop . . cybernetics . . digital computer . . discrete units . . equilibrium . . feedback . . gain . . thermistors.

See what we mean! Some of them aren't even in the dictionary; and still worse, words that ARE in the dictionary take on an "instrument" meaning that has nothing in common with the dictionary definition.

We're confused too and decided to confer with a few individuals who speak this new language and extract from them the down-to-earth meaning of at least a few of these mysterious terms. Results of these efforts will be featured in SP&I for February. The question-answer-example tabulation will not be complete and some definitions may be hotly criticized by experts, but at least we feel it is a step in the right direction.

INABILITY OF TRANSISTORS to handle sizable amounts of current has been a major drawback and one that many researchers in the electronic industry have been trying to overcome. Big stumbling block has been the problem of heat.

Minneapolis-Honeywell says they have discovered an effective means of removing heat from the germanium-alloy junction. Result is a thimble-size transistor that is 100 times as powerful as present commercial available types.

Power output of 20 watts contrasts with that of 20 hundredths of a watt for present commercial types of the electronic midgets that are replacing vacuum tubes in many applications.

ENGINEERING NEWS BRIEF--We recently learned that CIGARS CAN BE-LEFT-HANDED. "Rights" and "lefts" are made in the King Edward cigar plant in Jacksonville, Florida--apparently standard industry practice.

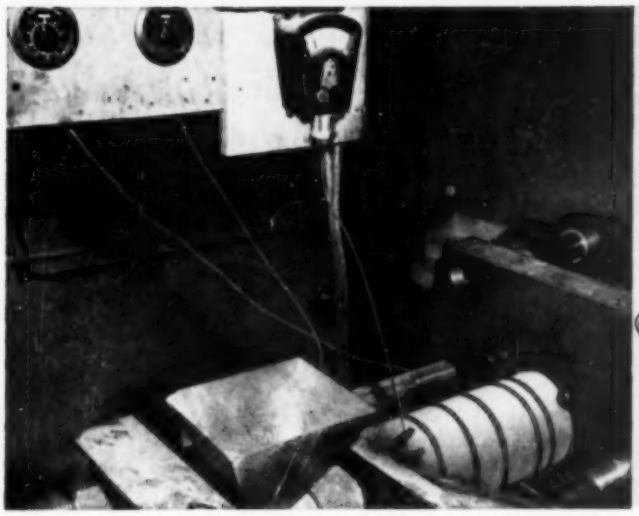
When the stem is removed from the center of the wrapper leaf, the two halves do not match as the veins are running in opposite directions. The machines bear even and odd numbers. Machines with even numbers use the right side of the stripped leaf and produce "right handed" cigars, and machines with odd numbers use the left portion and make "left handed" cigars.

"Rights" and "lefts" are never mixed. Machines are reversed mechanically so that they produce cigars with opposite spirals of wrapper.

Write the editors for additional information on any of the above items. SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 5, Ga.

CHROMALOX Production TIPS

PROFITABLE IDEAS FOR BETTER PRODUCTION with ELECTRIC HEAT

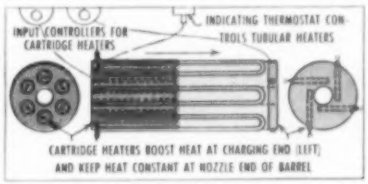


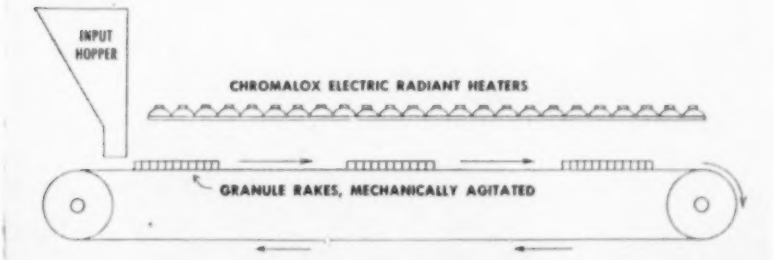
THESE CHROMALOX *Electric* HEATERS DID THE JOB

"ZONED" HEAT ANSWERS CRITICAL PROBLEM

Zones of heat, that are controlled easily and exactly to meet the molding characteristics of nylon just "come naturally" when Chromalox Electric Heaters are the heat source. Six thermostatically controlled Chromalox Tubular Heaters, clamped around the barrel, uniformly heat its entire length. Six Chromalox Cartridge Heaters inserted at the feed end act as booster heaters to liquefy the charge. Four Cartridge Heaters keep temperatures at the required levels in the nozzle. Each set of cartridge heaters is controlled by a Chromalox Input Controller; while an indicating thermostat controls the tubular heaters. Heat is regulated to the exact temperatures required for every mold size. Optimum operating heats are easily redialed when needed.

Diagram below illustrates the 3 heat zones, each controlled individually.


INPUT CONTROLLERS FOR CARTRIDGE HEATERS
INDICATING THERMOSTAT CONTROLS TUBULAR HEATERS
CARTRIDGE HEATERS BOOST HEAT AT CHARGING END (LEFT) AND KEEP HEAT CONSTANT AT NOZZLE END OF BARREL

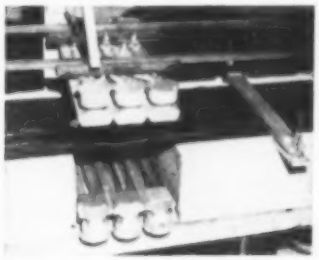


DRYING PLASTIC GRANULES SPEEDILY AND UNIFORMLY

One plant's solution for drying granules was this conveyorized set-up which dries the granules enroute from hopper to barrel. Chromalox Radiant Heaters are "color-blind;" their *far*-infrared energy is absorbed almost equally fast by all colors. Radiation is uniform; output is regulated easily to avoid overheating and sticking.

HOW PLASTIC RODS ARE BENT QUICKLY, EASILY, ECONOMICALLY

A table was built (photo A), with Chromalox Electric Radiant Heaters positioned above and below the portions of the rods to be heated. A forming press (photo B) was built to form the rods. About 30 rods, clamped together for efficient handling, are heated and formed at one time.



A—Concentrated *far*-infrared heat is absorbed efficiently and rapidly by plastic rods of all colors.

B—Forming jig bends heated rods quickly, was made in company's own shop.

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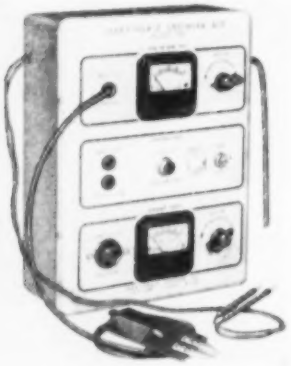
Equipment . . Supplies . . Methods

Free additional information is available to readers of SP&I. Circle the item code number on one of the reader service post cards provided on pages 17-18.

Device to Test Windings

A-1 MARTINDALE ELECTRIC CO., 1334 Hird Ave., Cleveland 7, Ohio, announces a newly designed device for the refinement of tests on armature and stator windings before assembly.



Martindale's Model 153 Growler Aid checks winding defects before assembly

Discovery of winding defects at this point saves a great deal of labor and expense. The Model 153 Growler Aid checks for short circuits, open circuits, and grounds. Sensitive meters on the Short-Test and Bar-to-Bar-Test sections show up defects by means of comparative readings.

Part of the tests are made in conjunction with a growler; other tests, such as the 500 volt ground test, can be made without the use of a growler.

General Purpose Maintenance Kit

A-2 NATIONAL CYLINDER GAS COMPANY, 840 N. Michigan Ave., Chicago 11, Ill., has introduced the "Sod-R-Braze" air-acetylene apparatus, which permits quick maintenance and repair work on all types of jobs where fusion welding is not essential.

The complete outfit consists of torch, tips, hose and adjustable regulator. Used with NCG's 40 cu ft acetylene cylinder, weighing approximately 32 lb net, it is easily portable within the shop or to outside jobs.

The torch is particularly suitable for work on sheet metal, steel piping, copper tubing, electrical apparatus, and automotive and electrical equipment. Despite the fact that it uses no oxygen, it permits fast work. For example, it will silver braze 3/16" copper tubing to brass fittings in approximately 38 seconds and will solder the same type of joint in about 26 seconds.

Electrical Hand Tool

A-3 INGERSOLL-RAND CO., 11 Broadway, New York 4, N. Y., announces a new electric Impactool designed to save time and effort on nut running, tapping, screw driving, reaming, drilling, and other jobs.

Ingersoll-Rand's 5 lb size 2U electric Impactool, rated for nut running up to ¼" bolt size, can be used for reaming, tapping, etc., in motor and engine repair operations, equipment installation and general maintenance.

The tool automatically delivers a series of powerful rotary blows to the work when resistance to turning is met, without kick or twist to the operator. It measures 9¾ in. overall. The motor cannot be burned out by overloading, and will operate from any 110 volt source, a-c (60, 50, 40 and 25 cycles) or d-c.

The ball and cam impact mechanism converts the full motor power to useful work with low current consumption and less heating. Accurate impact mechanism and motor armature alignment are assured by separate grease sealed ball bearings. Switch has extra current carrying capacity to eliminate burnouts.

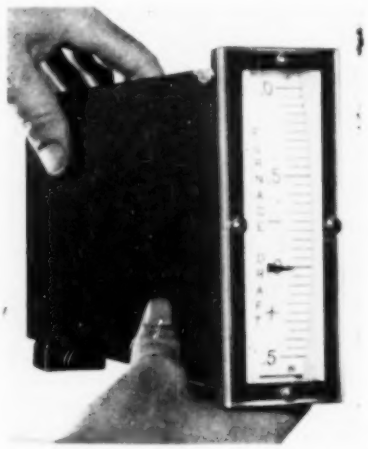
Bantam Draft Gauge

A-4 REPUBLIC FLOW METERS CO., 2241 Diversey Parkway, Chicago 47, Ill., has announced a new, bantam gauge for measuring draft, pressure, vacuum, or differential draft.

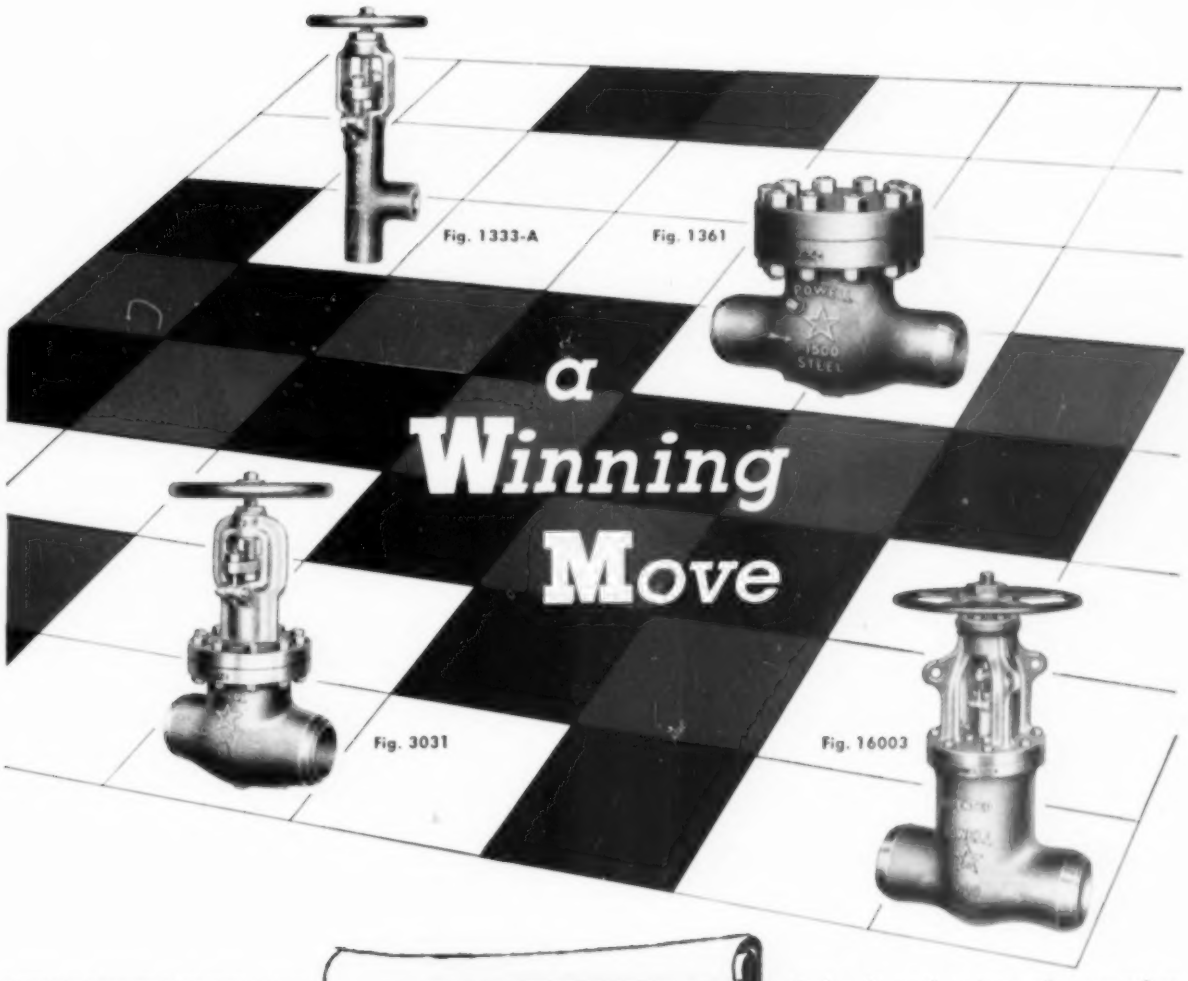
With a bezel only 6 7/16 in. high, the new gauge is ideal for use on compact console and graphic panels. As many as eight gauges may be mounted in a single case.

The five inch graduation length of the V-5 scale compares favorably with the scale length of larger sized gauges. Illumination from the rear by either incandescent or fluorescent bulbs increases visibility and readability at distances. The gauge can be connected into standard lighting circuits.

Full sized diaphragms or bellows are used in the gauge for no reduction in accuracy or sensitivity. Diaphragm



No extra transmitters or accessory mechanisms are needed to operate Republic Flow Meters' new bantam draft gauge.



INTEGRAL BONNET CAST STEEL ANGLE VALVE *(upper left)* **Fig. 1333-A.** 1500-pound. The one-piece construction of this compact high-pressure valve eliminates possibility of leakage between body and bonnet. Sizes ½" to 2", inclusive.

CAST STEEL SWING CHECK VALVE *(upper right)* **Fig. 1361 WE.** 1500-pound. Bolted flanged cap. Heavy rugged construction. Available in sizes 1" to 12", inclusive.

CAST STEEL GLOBE VALVE *(lower left)* **Fig. 3031 WE** for 300 pounds W.S.P. Bolted flanged bonnet. Outside screw stem and yoke. The valves are available in sizes 1" to 10", inclusive.

CAST STEEL PRESSURE SEAL GATE VALVE *(lower right)* **Fig. 16003.** 600-pound. Many proven advantages and exclusive features. Pressure Seal valves are also available in Non-Return, Check, Globe and Angle Patterns.

You're *always* the winner when you select Powell Valves. For every Powell Valve gives championship performance. They have a prize winning record of dependability since 1846.

And there's good reason why Powell Valves are always way out in front—*year after year.* Powell has probably done more valve research, solved more valve problems and makes more types of valves than any other organization in the world.

Shown here are just a few of the Powell Valves that can help you *checkmate the high cost of maintenance and replacement.* They're available through distributors in principal cities. If a distributor is not located near you, just write us. We'll be pleased to tell you more about these valves—and our complete line. The William Powell Company, Cincinnati 22, Ohio.

CONTROLS FOR THE LIFE LINES OF INDUSTRY

108th YEAR

Equipment . . Supplies . . Methods *(Continued)*

(Starts on page 8)

For more data circle item code number on the postage free post card — P. 17

elements are available for pressure ranges as low as 0.6 in. and as high as 40 in. of water. Equipped with bellows elements, the gauge may be used as a receiver for pneumatic transmission pressures between 5 and 30 psi. The gauge can also be furnished with two bellows and two pointers for steam flow-air flow or fuel-air indication.

Explosion-Proof Lighting Unit

A-5 APPLETON ELECTRIC COMPANY, 1738 Wellington Ave., Chicago 13, Ill., has developed a new explosion-proof lighting unit, featuring one standardized body to fit both 60 and 200 watt and 300/500 watt dome unit assemblies.

Appleton's Vented "AA-51" Series lighting unit. Screw driver inserted into notches on a standardized Unilet body uses release lugs for fulcrum. Entire unit, including lamp, unscrews in a jiffy. Reverse procedure with a fresh unit and the job is complete with speed and safety—even if the current is inadvertently left on while change is made.

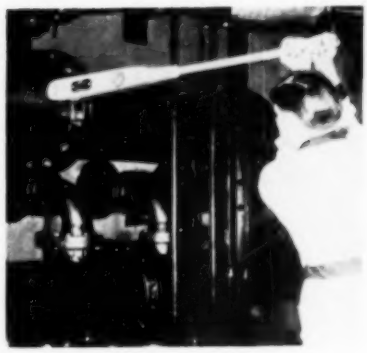
Designed for use in hazardous areas in Class I, Groups C and D, the units may be serviced safely in less than one minute. Exclusive 5 thread safety chamber means that there are always five full threads engaged when contact is made or broken. Thus any arcing, due to current being left on during exchange of fixtures, is always confined in approved explosion-proof manner.

Because of the interchangeability of the dome unit assemblies it is possible to set up a stand-by system which takes care of lamp replacement and increased wattage needs. This system is based on a ratio of one stand-by unit in stock for every ten units in service.

Torque Wrench

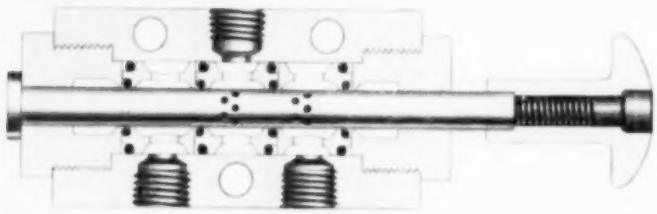
A-6 MANZEL DIVISION OF FRONTIER INDUSTRIES, INC., 318 Babcock St., Buffalo 10, N. Y., is offering a torque wrench of 0 to 1000 ft lb capacity to accurately tighten nuts to any predetermined stress during the construction or servicing of equipment in plant, laboratory or field.

This wrench definitely shows when nuts and bolts are tight enough and not too tight. The dial accurately registers torque reading and remains at a maximum after tension is released, thus a careful check of obtained tension is possible after pulling has ceased. The dial is reset by turning the center knob.



Manzel 1,000 lb torque wrench.

When the Manzel Torque Wrench is used each bolt will carry its proportionate share of the designated load, assuring uniform tension to prevent equipment failures caused by improper or uneven torquing of nuts and bolts. Where heat and pressure are involved, this correct torquing is doubly important due to the increased stress on each part caused by expansion.



Principal parts of C. B. Hunt & Son's control valve design consist of a housing with straight through bore; gland nuts for the ends; a hollow radially ported ground and polished stainless steel plunger; internal spacers that are held firmly in metal-to-metal end abutment; and two sizes of "O" rings

Control Valve Design

A-7 C. B. HUNT & SON, INC., Salem, Ohio, manufacturers of Quick-As-Wink Air and Hydraulic Control Valves, have developed new interior construction for control valves that greatly simplifies the valve, and assures positive positioning of the sealing packers without placing any mechanical pressure on the packers themselves.

The principal parts are shown in the cutaway view. In assembly, the "O" rings are placed on the shoulders of the spacers, which are then inserted in the housing. Tightening the gland nuts positions the spacers accurately in the housing and holds the "O" rings in position without subjecting them to any mechanical pressure. The "O" ring packings are subjected only to the fluid pressure in the adjacent chambers—and are supported on both their inside and outside diameters.

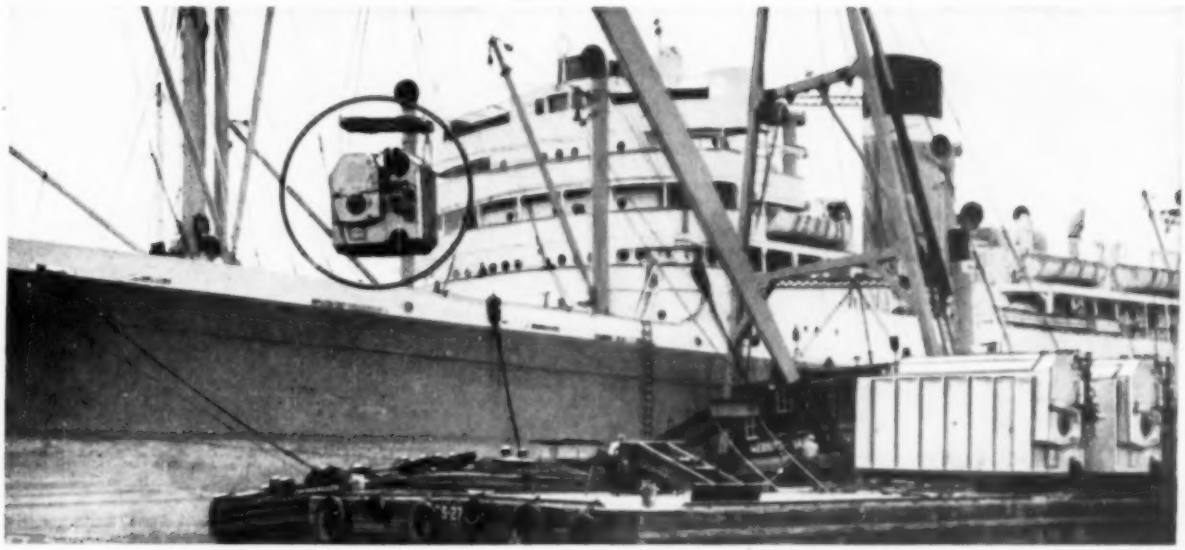
There are no lapped joints, and no metal to metal seating. Maintenance is extremely low, and under normal conditions consists simply of the very occasional replacement of the "O" packings. This can be accomplished quickly in the field by simply removing the gland nuts, usually without even disturbing the connecting piping.

Valves are available in push-pull, push spring return, hand, foot, cam, diaphragm, pilot, and single or double solenoid operated, with 2-way, 3-way, 4-way or 5-way actions and either

(Continued on page 105)

keeping steam cheap . . .

BOILERS FOR Bombay



Off to a long productive "career" in foreign service, these three B&W Type FM Boilers are hoisted aboard ship at New York for the long voyage to Bombay, India. They will be followed shortly by another one.

more and more B&W Type FM Units are going into foreign service

Loading for their trip to the other side of the earth, these three B&W Integral-Furnace Boilers, Type FM, typify the growing demand for these compact, shop-assembled units by industries in many parts of the world. Ordered by the Standard-Vacuum Oil Company for their new Stanvac Bombay Refinery in India, these self-contained, B&W steam-generating units each will provide 20,000 lb of superheated steam per hr.

A water-tube unit with a fully water-cooled furnace, the B&W Type FM Boiler is designed for indoor or outdoor operation . . . is suitable for single or multiple-unit installation . . . is simple in operation, with push-button start and stop, and automatic control for meeting quick load variations. Delivered assembled, the FM Boiler is ready to be lifted or skidded into position, connected to fuel, water, and electric services, and put to work.

Combining the benefits of "packaged" steam with the advantages of big boiler design, the versatile B&W Type FM Boiler is being selected for more and more foreign installations . . . is already serving a wide variety of domestic industries, utilities, and other users. FM Units having a total steam capacity of over 7,000,000 lb per hr are now in service or on order. Available in standard sizes for loads ranging between 2900 and 28,000 lb of steam per hr at pressures from 15 to 235 psi, B&W's "midget workhorse" is also obtainable for operation at higher pressures.

OTHER COST-SAVING FEATURES

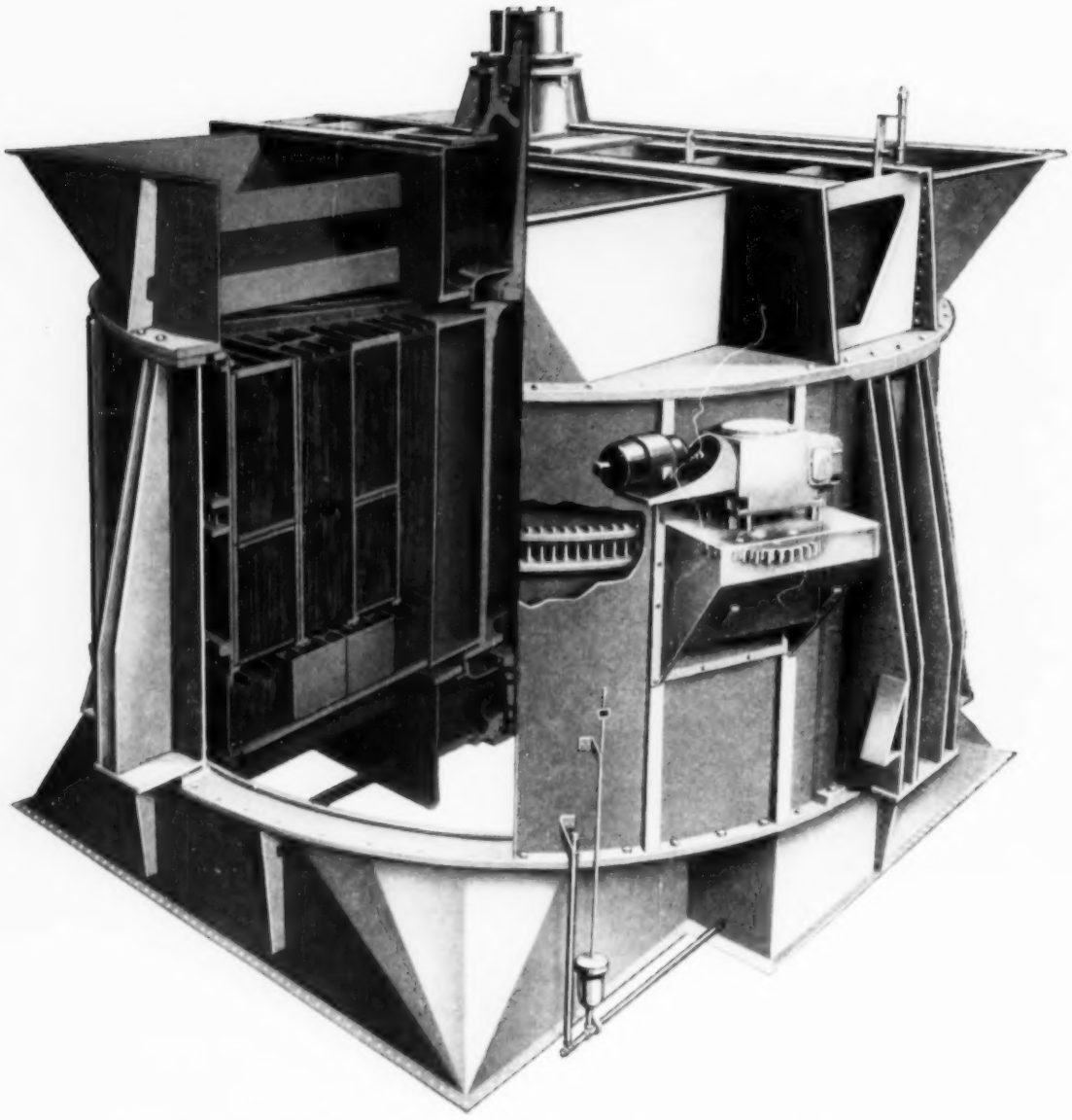
- Saves Erection Time and Cost
- Meets Wide Range of Service
- Fast Steaming
- Low Maintenance
- Easy Accessibility
- Burns Oil and /or Gas
- Saves Fuel
- Saves Space

Write for Bulletin G-76 for full details about this unique, small boiler. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.

G-627

BABCOCK & WILCOX

BOILER DIVISION



THE LJUNGSTROM AIR PREHEATER

cuts fuel costs in hundreds of plants

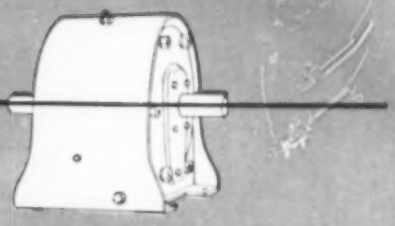
The Ljungstrom Air Preheater has proved its value in industrial and utility plants throughout the country. That's why every year, a constantly increasing percentage of the total installed boiler capacity is Ljungstrom-equipped. *Your fuel costs will drop, too,* when you equip your boilers with Ljungstroms. The extremely high efficiency of the regenerative design means the greatest possible recovery of waste heat . . . with substantially lower fuel requirements.

If you are planning a new boiler installation – or expanding or modernizing your present one – let our engineers show you how the Ljungstrom can raise over-all efficiency in your plant.

Ljungstrom Air Preheaters are now available for boilers of any type or capacity from 25,000 pounds of steam per hour up.

The Air Preheater Corporation 60 East 42nd Street, New York 17, N. Y.

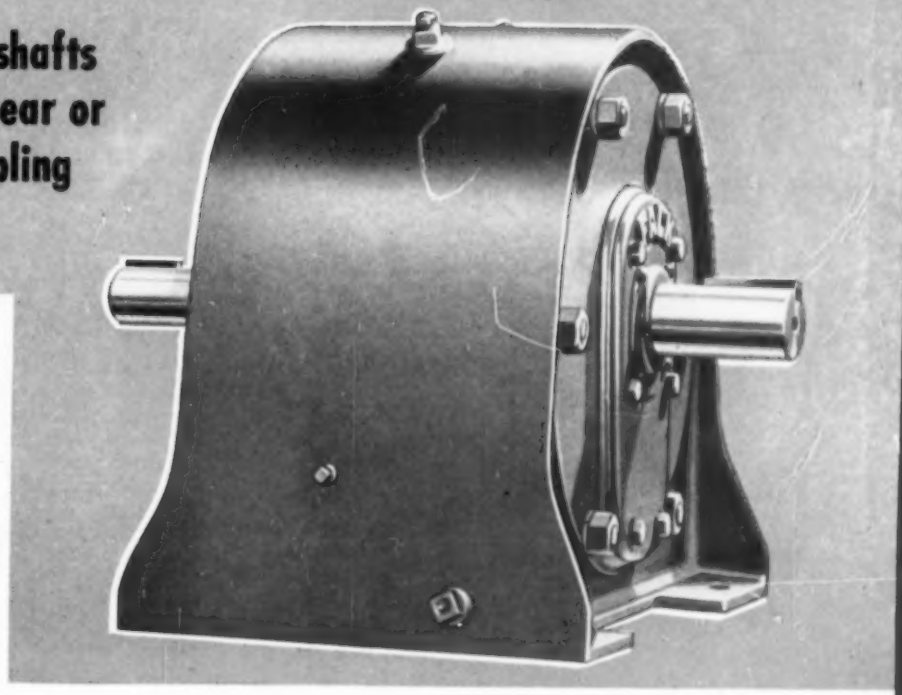
The versatile, STRAIGHT LINE

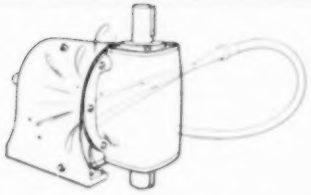


ALL-STEEL FALK SPEED REDUCER

(Concentric Type)

High and low speed shafts suitable for V-belt, gear or chain as well as coupling connections





The Type "C" Speed Reducer has these "In-built" Factors:

Sealed Housings. Dual closures and one-way vents keep oil in, dust and moisture out. Units are splash-proof, leakproof, dust-proof.

Positive Lubrication. Large sump capacity . . . oil-tight construction assures clean lubricant . . . direct dip of revolving elements provides positive lubrication at all speeds.

Precision Gearing. Heat treated alloy steel, precision cut and shaved helical gearing throughout . . . quiet-operating crown shaved pinions . . . taper bored gears for easy ratio changes.

Wide Speed Range. Selective ratio combinations provide output speeds from 1.5 rpm to 1430 rpm with stock gears.

All-steel Housings. Unbreakable, strong, rigid. Generous overhung load capacities provided by wide bearing spans, large shafts and bearings.

Streamlined inside and outside. Smooth, clean surfaces, machine welded construction conforms to NEMA motor frames.

A FEW TYPICAL DRIVES FOR "C" AND "CB" UNITS

COUPLING TO "CB" UNIT

V-BELT TO "C" UNIT

CHAIN TO "CB" UNIT

Write for Bulletin 1104

The ideal type for Turbine, Engine or Special Motor

Here is an exceptionally versatile member of the famous FALK line of reduction units. The Type "C" Straight Line Speed Reducer is an all-steel concentric shaft unit rated in accordance with AGMA standards. It is structurally similar to the universally popular FALK Motoreducer, and offers many special application advantages.

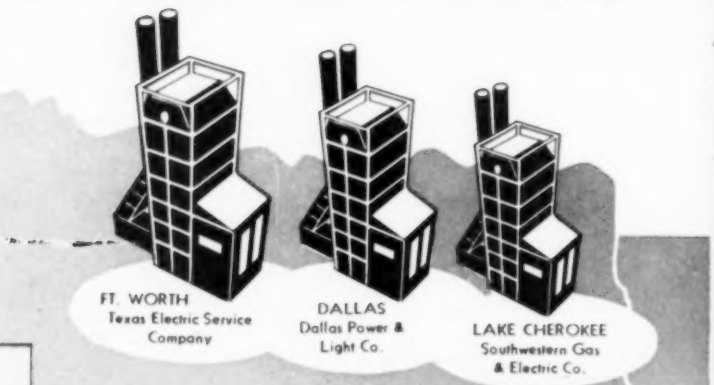
It can be driven by motor, turbine or engine with direct coupling connection—or through a V-belt or chain drive. It lends itself effectively to hydraulic coupling, brake-wheel or overload protective coupling, multi-speed transmission, or to variable speed drives—without modification. Units can include self-contained backstop if desired. Ratio can be modified with easily installed stock gears. With modifications, unit can be used as a speed increaser.

These all-steel Straight Line Speed Reducers are *available for prompt delivery* in standard ratios in horizontal and vertical concentric models, also in horizontal and vertical right-angle models; in single, double, triple and quadruple reduction. For full details, write for Bulletin 1104.

FALK ... a good name in industry

THE FALK CORPORATION · 3001 W. Canal St. · Milwaukee 8, Wis.

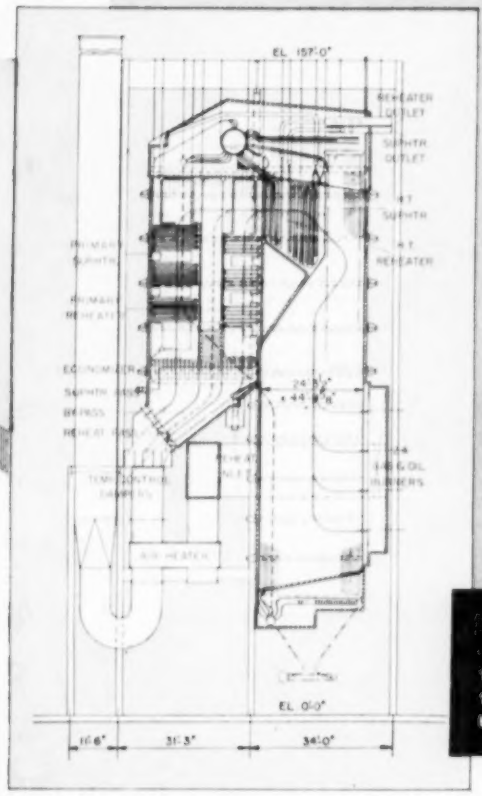
MORE POWER



FT. WORTH
Texas Electric Service Company

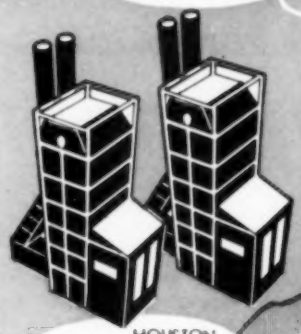
DALLAS
Dallas Power & Light Co.

LAKE CHEROKEE
Southwestern Gas & Electric Co.



RILEY Reheat Units Feature Damper Steam Temperature Control

In these Riley Reheat designs both steam and reheat temperatures are maintained constant by damper control. Dampers located below the economizer automatically proportion gases over primary reheater and superheater surfaces. At high loads, part of flue gas passes through open lane between superheater and reheater surfaces.



HOUSTON
Houston Lighting & Power Co.

TEXAS ELECTRIC SERVICE COMPANY — FT. WORTH
1,250,000 lbs./hr. capacity—2125 psig 1005°F Superheat—1005°F Reheat. Fired by Gas & Oil—Ebasco Services, Engineers

TRADE MARK Rx REGISTERED

RILEY
STOKER CORPORATION

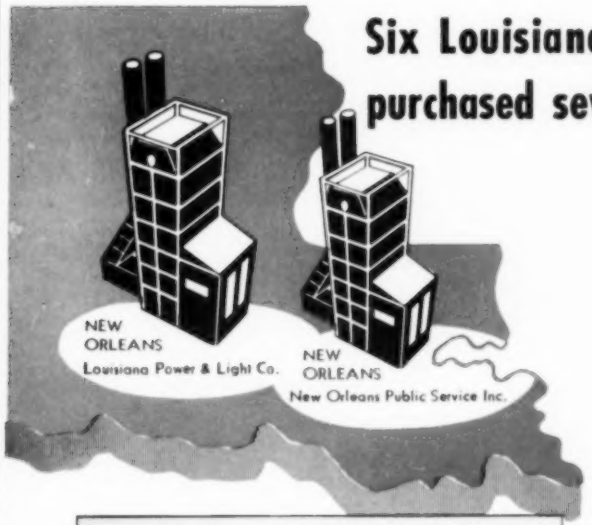
WORCESTER, MASS.
Boston, New York, Philadelphia, Buffalo, Washington, Pittsburgh, Cleveland, Detroit, Chicago, Cincinnati, Charlotte, New Orleans, Atlanta, St. Louis, Kansas City, St. Paul, Tulsa, Houston, Denver, Salt Lake City, Los Angeles, Portland, Seattle

COMPLETE STEAM GENERATING UNITS

BOILERS • PULVERIZERS • BURNERS • STOKERS • SUPERHEATERS • ECONOMIZERS
WATER-COOLED FURNACES • STEEL-CLAD INSULATED SETTINGS • AIR HEATERS

TO THE SOUTH!

Recent Public Utility Orders Predominantly Riley . . . .



Six Louisiana and Texas Public Utilities recently purchased seven steam generating units from Riley

Louisiana Power & Light Company
1,000,000 lbs./hr. Reheat Unit—Ebasco Services, Engineers

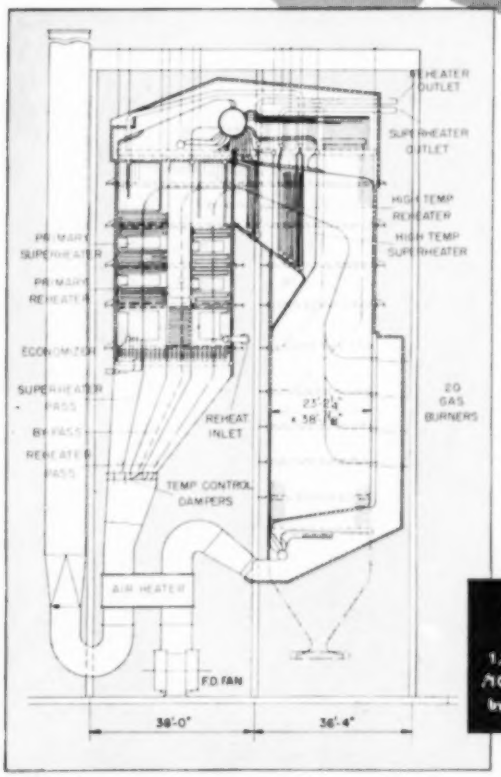
Texas Electric Service Company
1,250,000 lbs./hr. Reheat Unit—Ebasco Services, Engineers

Houston Lighting and Power Company
2—1,250,000 lbs./hr. Reheat Units—Ebasco Services, Engineers

Dallas Power and Light Company
1,050,000 lbs./hr. Unit—Ebasco Services, Engineers

New Orleans Public Service, Inc.
975,000 lbs./hr. Unit—Ebasco Services, Engineers

Southwestern Gas & Electric Company
650,000 lbs./hr. Unit—Sargent & Lundy, Engineers



LOUISIANA POWER & LIGHT COMPANY — NEW ORLEANS
1,000,000 lbs./hr. capacity — 1725 psig — 1005°F Superheat—1005°F Reheat. Fired by Gas & Oil—Ebasco Services, Engineers

In 1953 an impressive array of Texas and Louisiana public utilities have teamed up with Riley. Houston Lighting and Power Company, long a satisfied Riley customer, recently ordered two Riley 1,250,000 lbs./hr. Riley reheat units, giving them eleven Riley units with a capacity of 6,890,000 lbs./hr. Texas Electric Service Co. has one Riley reheat unit on order. In addition, Dallas Power & Light Company will install a 1,050,000 lbs./hr. Riley steam generating unit, and only recently New Orleans Public Service, Inc. has ordered a 975,000 lbs./hr. Riley unit, its second Riley boiler.

In 1952, both Southwestern Gas & Electric Company and Louisiana Power & Light Company placed their first orders with Riley. Louisiana Power and Light Company's 1,000,000 lbs./hr. unit will be the World's first reheat unit fired by natural gas.

This sales record shows that when it comes to the largest steam generating units more and more public utilities are swinging to Riley. If you, too, are considering steam generating additions to your power facilities it will pay to learn first what Riley can do for you.

WHERE TO GET IT
And How to Do It

–INDEX OF HELPFUL BOOKLETS, BULLETINS, REFERENCE LITERATURE–

Cooperating with leading manufacturers of equipment and supplies, SPI makes available for the asking without cost or obligation, the following valuable bulletins, booklets, handbooks and catalogs.

Check the list, fill in Coupon, mail to SOUTHERN POWER & INDUSTRY. (Coupon Post Cards on pages 17 and 18.) This service restricted to those interested in the operation or design of Industrial, Power and Service Plants.

STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

11 **CONTROLLED FLOW GAS DAMPERS**—Catalog 10—Describes the reliable operation, increased capacity, reduced maintenance, greater flexibility, higher efficiency and other advantages gained by the Heacon damper in controlled flow of gases —THERMIX ENGINEERING CO.

25 **DOUBLE-PASS BOILERS** — Bulletin 153—Gives complete specifications of a new double pass all-purpose industrial and heating boiler, "Southern made for Southern trade." Sizes from 44 to 153 hp S.B.I. with pressure up to 150 lb, designed for coal, gas or oil firing. This is a complete package double-pass unit, recently added to a regular line of single-pass firebox boilers manufactured since 1918.—LUCEY BOILER & MANUFACTURING CORP.

29 **CONTINUOUS BLOW-OFF**—Bulletin, 8 pages—Gives the basic facts about boiler blow-off, and describes the Madden system of control of continuous blow-off for the removal of solids and impurities from steam releasing surfaces.—THE MADDEN CORPORATION.

34 **BAFFLE WALLS**—Bulletin BW-44, 20 pages—Valuable data on modern baffle wall design and construction for all waterttube boilers.—THE ENGINEER CO.

40 **OIL AND GAS BURNERS, STOKERS**—Form 1753, 16 pages—Gives descriptions, illustrations, engineering data and Selector Guide—Capacity Tables covering all fuel burning equipment.—IRON FIREMAN MFG. CO.

42 **SINGLE RETORT UNDERFEED STOKER**—Bulletin 350, 28 pages—Describes an efficient, compact, single retort stoker, mechanically driven either by electric or steam drive for burning successfully various grades of bituminous coal, 50 to 150 hp rated capacity. Replete with installation views and details. Many Southern plants described.—DETROIT STOKER CO.

43 **SOOT BLOWERS** — Bulletin 1002—Illustrates and describes Vulcan long retractables, with air or electric two-motor drive for better cleaning and lower maintenance. Blow with steam or air.—COPES-VULCAN DIVISION, CONTINENTAL FOUNDRY & MACHINE COMPANY.

44 **CHIMNEYS — INDUSTRIAL AND INSTITUTIONAL**—Brochure—Outlines services available for the construction, design and maintenance of all types of industrial and institutional chimneys.—INTERNATIONAL CHIMNEY CORP.

48 **BOILER TUBES**—Booklet, available upon request, gives details concerning weights and other data of tubing and pipe, their working pressure scales, and the bending operations used in forming. Useful charts and engineering information. —BOILER TUBE CO. OF AMERICA.

55 **HIGH-DUTY FIREBRICK**—Bulletin 103—Describes a complete line of high-duty dry-pressed firebrick for all sorts of furnaces—boiler, forge, gas plant, glass, open hearth, billet, soaking—for ceramic kilns, smoke stacks, incinerators, and the like—prompt shipment in convenient form.—THE IRONTON FIREBRICK CO.

65 **REFRACTORY CASTABLES**—Bulletin 104—Describes a complete line of castable refractory concretes for monolithic and castable construction with widespread application in heat treating furnaces, forge and boiler furnaces, in ovens, ducts, covers, linings, arches, baffles, ports, pits, walls—for service from zero to 3000 F. —THE IRONTON FIREBRICK CO.

73 **BOILER HEAT TRANSFER** — 4 page bulletin explains a patented method of cyclonic combustion to produce improved heat transfer in boiler installations. Illustrates resulting steam generators and discusses their application and operation.— CYCLOTHERM DIVISION, U. S. RADIATOR CORP.

76 **GAS BURNER** — Bulletin — Describes the Rectilinear gas burner, an application of the venturi principle which provides high input through narrow rectangular openings for firing—in a horizontal plane through fire doors or small openings over handfired coal grates or stokers—or for firing in a vertical plane on either side of stoker or oil burner.—THE WEBSTER ENGINEERING COMPANY.

81 **FLY ASH AND DUST RECOVERY** —Engineering Booklet—Gives data and illustrations on the multiclone mechanical dust collector, showing basic principles and typical application for dust and fly ash recovery.—WESTERN PRECIPITATION CORP.

98 **FUEL OIL TREATMENT**—Bulletin 50, 4 pages—Explains how Nalco SR-155 improves combustion and stops corrosion and sludge formation in fuel oil tanks, lines and equipment.—NATIONAL ALUMINATE CORP.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

104 **HEAT EXCHANGERS** — Bulletin FF-FD-0-001, 12 pages—Describes Fin-Fan heat exchangers, air cooled units designed for a wide variety of industrial cooling and condensing applications—to replace or augment water-cooled heat exchangers.—THE FLUOR CORPORATION.

106 **BLOWERS AND FANS**—Bulletin 12-R-53 — Describes Montgomery Blo-Rite fans and centrifugal blowers, particularly intended for material handling. These are extra heavy, high efficiency fans and blowers to handle the most difficult jobs of air and materials movement.—JACKSONVILLE BLOW PIPE CO.

108 **RECIPROCATING COMPRESSOR** —Bulletin M-70, 44 pages—The M-Line multi-stage, multi-cylinder, 100 to 5000 hp, 250 to 514 rpm reciprocating compressors. Applications and installations illustrated with photographs and cut-away views.—THE COOPER-BESSEMER CORP.

155 **PROPORTIONING PUMPS**—Bulletin 52—Contains data on chemical feed packaged units made up of sturdy steel storage tank and high pressure low capacity proportioning pump—application and specification data.—THE BIRD-ARCHER COMPANY.

169 **FORCED DRAFT FANS** — Bulletin 300, 8 pages—Describes features of the Prat-Daniel forced draft fans of new design, explaining the split-wheel design for four way diffusion.—THE THERMIX CORP.

INSTRUMENTS—METERS CONTROLS—REGULATORS

200 **TEMPERATURE REGULATORS**—Bulletin 329 gives information regarding the No. 11 self-operated regulator, used on water and oil heaters, tanks, vats, kettles, dryers, process equipment, etc. Tables for selecting proper size illustrate broad scope, and give pertinent application data.—THE POWERS REGULATOR CO.

206 **PRESSURE TRANSMITTER** — Bulletin—Describes the Microsen pressure transmitter which is used to transmit pressure measurements from their source to a central point, through simple electric wiring.—MANNING, MAXWELL & MOORE, INC.

219 **NON-FROSTING GAGES** — Unit Data 177—Describes and illustrates non-frosting gages for use in reading liquid levels in processes involving low temperature fluids—particularly in the chemical, petroleum and process industries—for ammonia, freon and other gases.—JERGUSON GAGE & VALVE CO.

235 **ELECTRIC THERMOSTATS**—Bulletin 1000 describes simple electric thermostats which provide temperature control for heating, air conditioning, refrigeration and industrial applications. Features aquastats and immersion, room and strap-on (surface) thermostats.—SARCO CO., INC.

259 **CONTROL VALVES**—Catalog 552 describes a complete line of two, three, four-way, multi-port, metering, distributing and special type valves. Lever, foot, solenoid and motor types for all mediums, with pressures up to 5000 lb. W. H. NICHOLSON & CO.

261 **FEEDWATER CONTROL SYSTEMS IN GEORGIA**—Bulletin 489 —gives performance reports on Copes feed control systems at Plants Yates, Atkinson and Arkwright of Georgia Power Co.—illustrated with photographs, diagrams and charts.—COPES-VULCAN DIV., CONTINENTAL FOUNDRY & MACHINE CO.

264 **LEVEL CONTROLLER** — Bulletin F-2 describes the "Level-Trol," a level controller which is readily exchanged, replaced or repaired and which features one control for proportional band and specific gravity adjustments, using pneumatic pilot without intervening links or mechanical joints.—FISHER GOVERNOR CO.

273 **ELECTRONIC INSTRUMENTS**—Bulletin 231—Lists the features and explains the operation and application of various standard electronic meters and instruments. Discusses ranges, power supply and accuracy.—BAILEY METER COMPANY.

PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

305 **INDUSTRIAL HEATING** — Catalog 50, 50 pages—Gives data on the type and size of electric heating units and similar equipment for industrial heating needs. Detailed diagrams and photographs describe applications.—EDWIN L. WIEGAND CO.

309 **WIRE CLOTH**—Catalog, 103 pages —Gives wire cloth ranges and specifications for grades from 20 x 250 mesh up to 4" openings. Illustrates facilities for fabricating wire cloth parts and fabricated alloys.—THE CAMBRIDGE WIRE CLOTH CO.

314 **CONVEYING AND DUST COLLECTORS** — Bulletin 10-H-53 — Describes the Montgomery "Blow-Rite" system for pneumatic conveying and for dust collecting—intended to handle the most difficult type of job.—JACKSONVILLE BLOW-PIPE COMPANY.

315 **TANKS OF STEEL AND ALLOYS** —Catalog 102-P&BS—All types of tanks for hot water storage, bulk liquid storage, oil or chemical storage, and other unfired pressure vessel use.—J. J. FINNIGAN CO.

331 **HYDRAULIC CYLINDER**—Bulletin 701, 28 pages—Describes a complete line of hydraulic cylinders and gives diagrams, photographs, charts and engineering data in explanation of the different types, with capacities up to 1500 psi steam and 3000 psi water working pressures.—LINDBERG ENGINEERING COMPANY.

338 **WROUGHT IRON FOR GAS AND COAL HANDLING**—A special report of particular value to those interested in obtaining increased life from their flue gas, coal handling and comparable equipment.—A. M. BYERS CO.

366 **UNIT HEATER RATINGS**—Bulletin No. 231, 8 pages—Gives the Btu output rating for various models of 30 different makes of unit heaters. Tells how to figure condensing rates, how to select traps and determine heater output at various fan speeds.—ARMSTRONG MACHINE WORKS.

PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

401 **STEAM HUMIDIFIERS** — Bulletin 1775—Describes steam humidifiers to control air humidification in order to reduce weight loss, quality loss, production loss, fire loss and human efficiency loss as a result of too dry air. Details as to applications and installations.—ARMSTRONG MACHINE WORKS.

403 **VALVE OPERATORS, SPROCKET RIMS**—Bulletin SB—Describes and illustrates adjustable sprocket rims with chain guides, and other forms of Babbitt valve operators and controls.—BABBITT STEAM SPECIALTY CO.

424 **WROUGHT IRON NIPPLES**—Bulletin 20M-H-53, 4 pages—Gives identification and engineering details, such as size and service, of wrought iron nipples. Tables of sizes and lengths of both standard weight and extra strong styles. — A. M. BYERS COMPANY.

427 **STRAINERS AND SEPARATORS**—Bulletin AD-1635—Stopping 2-way waste with sediment separators and strainers, for high and low working pressure.—CRANE CO.

434 **PIPE LINE STRAINERS**—Bulletin 128-A, 4 pages—Gives service data, specifications, applications and purchasing instructions for No. M-528 suction and pressure strainers with clamped or bolted covers, and for No. M-530 self-cleaning "Y" strainers.—McALEAR MANUFACTURING COMPANY.

440 **STEAM TRAP CHART** — Bulletin 145 features an illustrated chart for easy selection of right types and sizes of steam trap for each application. Lists advantages and special features for each type; thermostatic, bucket, float and liquid expansion—SARCO CO., INC.

465 **STEAM JACKETED VALVES** — Bulletin describes valves for handling viscous materials which congeal or harden and will not flow at ordinary temperature.—EVERLASTING VALVE CO.

482 **CAST IRON STEEL VALVE BODIES**—Bulletin R-1 — Describes "D" and "DA" cast steel 3000 lb and 6000 lb cast steel angle and globe pattern, single seated valve bodies with venturi type seat rings.—FISHER GOVERNOR CO.

486 **BRONZE GATE VALVES**—Bulletin V-260—Gives in concise form the general specifications of standard bronze gate valves, including solder and brazed-end valves. Construction features illustrated with the 300 lb union bonnet gate valve.—THE FAIRBANKS COMPANY.

MAINTENANCE PACKING GASKETS, LUBRICATION

515 **INDUSTRIAL VACUUM CLEANING**—Booklet A-706, 4 pages—Describes the wide application of Hoffman heavy duty portable and stationary industrial vacuum cleaning systems in increasing production, improving quality, reducing maintenance costs and promoting better plant safety, cleanliness and morale.—U. S. HOFFMAN MACHINERY CORP., AIR APPLIANCE DIVISION.

538 **PRODUCTS FOR PROCESS INDUSTRIES** — Bulletin IP-28A, 8 pages—Describes industrial insulation, refractories and insulating brick for furnaces, ovens and kilns, overhead and underground pipelines, packings, gaskets and other products used generally in process industries.—JOHNS-MANVILLE, INC.

572 **CLEANING BLAST FURNACE STOVES**—Bulletin 5152—Describes how flue dust deposits and other caking are removed from the checker works surface of blast furnace stoves without interruption of iron production.—DOWELL, INC.

574 **ANTI-CORROSIVE PAINTS**—Bulletin, "25th Anniversary Edition" and color cards—Describes a complete line of anti-corrosive paints for protection against weather, moisture and alkali, with details as to application.—SUBOX, INC.

588 **PIPE JOINT COMPOUND** — PLS Bulletin—Gives full information on "John Crane" plastic lead seal—a never hardening, all-purpose compound for sealing and lubricating pipe joints, threaded connections, studs, gaskets, etc.—general, chemical, corrosive and refinery service, high or low temperatures and pressures. — CRANE PACKING CO.

ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

619 **WOVEN WIRE SLINGS** — Illustrated handbook shows construction details of gripper woven wire slings, with views showing how such slings are used for both production work and general materials handling. — THE CAMBRIDGE WIRE CLOTH CO.

621 **POWER TRANSMISSION AND EQUIPMENT** — Catalog 40 — Gives comprehensive details of a complete line of power transmission including V-Belt drives, flat belt drives, pulleys, gears, chains, sprockets.—Industrial Division of CONTINENTAL GIN CO.

644 **COAL HANDLING**—Book 2855, 28 pages—"Scientific Coal Preparation Methods and Equipment," gives installation views, flow diagrams, typical applications of low cost handling and better preparation of coal at the mine.—LINK-BELT CO.

653 **MONORAIL STACKER CRANES**—Bulletin AMS-1 — Outlines advantages gained by using specially designed stacker cranes for the storage of various materials under specific conditions.—AMERICAN MONORAIL CO.

682 **SUPERCHARGED GAS ENGINES** —Bulletin L-68—Describes vertical four cycle, 6, 7 and 8 cylinder, 15¼ x 22 in. stroke, Type LS supercharged gas engine, giving complete specifications, standard and special equipment, weight, horsepower, operating characteristics and applications.—THE COOPER-BESSEMER CORP.

WATER TREATMENT, HEATING, VENTILATING, AIR CONDITIONING, REFRIGERATION, DUST & FUME CONTROL

706 **BOILER FEEDWATER TREATMENT**—Bulletin 68, 8 pages—The Treatment of Low Hardness Boiler Feedwater—Explains the Nalco system of water treatment as applied to plants having low makeup, or naturally soft, pre-softened, or evaporated boiler feedwater. Stabilization, sludge conditioning, steam conditioning and metal protection are objectives discussed.—NATIONAL ALUMINATE CORP.

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1-54-1

Please send me without obligation, free booklets described in the January, 1954, issue of SOUTHERN POWER AND INDUSTRY as circled below.

11	25	29	34	40	42	43	44	48	55	65	73	76	81	98	104	106
108	155	169	200	206	219	235	259	261	264	273	305	309	314	315	331	338
366	401	403	424	427	434	440	465	482	486	515	538	572	574	588	619	621
644	653	682	706	713	758	764	772	804	806	831	836	864	878	906	907	957
960	969	984	992	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
M14	M15	M16	M17	M18	M19	M20	M21									

Also send further information on following New Equipment (page 8)

A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	A-13	A-14
A-15													

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713 **CORROSION PROTECTION OF STEAM AND CONDENSATE RETURN SYSTEMS**—Folder—Describes the recently developed Amine treatment which tends to prohibit corrosion of boiler and condensate systems by surface protection of the metal itself, while raising the pH value of the condensate.—THE BIRD-ARCHER COMPANY.

758 **REFRIGERANT PURGERS**—Bulletin 331, 4 pages—Describes a forged steel purger for venting air and other noncondensable gases from refrigerating systems. Discusses the air problem, explains how the purger operates, and gives engineering data and installation photographs. ARMSTRONG MACHINE WORKS.

764 **REFRIGERATION CENTERS**—Bulletin 136-A—Shows the varied services a community ice plant and refrigeration center can provide including quick freezing, cold storage lockers, cold storage. —FRICK COMPANY.

772 **UNIT HEATERS**—Bulletin No. 300, 8 pages—Complete design and application information on the new Thermobloc direct fired unit heater, delivering 550,000 Btu per hour of draftless heated air at efficiency of 82 to 86%, burning No. 2 oil or lighter, or gas, and occupying a floor space of only 36 inches in diameter.—FRAT-DANIEL CORPORATION.

ELECTRICAL

804 **CUBICLES, PANELS, ENCLOSURES**—Descriptive Booklet—"Contract Manufacturing in Sheet Metals"—Describes job-fitted control centers, bus enclosures, cubicles, switchgear housing and other sheet metal assemblies for utility and industrial plants.—THE KIRK & BLUM MFG. CO.

806 **MOTORS AND GENERATORS**—Brochure 100, 12 pages—Gives the design, engineering data, performance, and applications of Electro Dynamic motors and generators. Charts aid in selection of size and type. Electrical and mechanical modifications available for particular installation needs.—ELECTRO DYNAMICS DIVISION, GENERAL DYNAMICS CORP.

831 **ELECTRIC HEATING CABLE**—Bulletin F-1527—Describes "Thermwire," a low cost, easily applied flexible electric heating cable, a versatile new product with many uses and applications in industrial and commercial processing.—EDWIN L. WIEGAND CO.

836 **MINING CIRCUIT BREAKERS**—Bulletin 6207 — Is an illustrated technical bulletin published in advance of forthcoming application data for electrical protection in coal mines. Included are a resume of Bureau of Mines findings on circuit breaker application and a preliminary outline of an I-T-E publication on mine sectionalization.—I-T-E CIRCUIT BREAKER COMPANY.

864 **ELECTRICAL SYSTEM PLANNING** Book C-87—"Power Up," 51 page book on electrical system planning, maintenance and modernization for industrial plants. Important sections on installation and maintenance of industrial electrical distribution systems; wire cable and conduit data; motor application data; and electrical systems reference data.—ANACONDA WIRE & CABLE CO.

878 **ENCLOSED ELECTRIC POWER DRIVES**—Bulletin 169, 4 pages—Gives details of modern totally enclosed electric power drives, with details as to engineering design and applications.—STERLING ELECTRIC MOTORS.

MISCELLANEOUS . . . SAFETY, BUILDING EQUIPMENT, METALS

906 **INDUSTRIAL DUST COLLECTOR**—Catalog 101 — Describes the Aerotec industrial dust collector, available in self-contained, custom-built industrial assemblies which may be adapted as integral parts of existing equipment, with tube performance records given on eight representative dusts.—THERMIX ENGINEERING CO.

907 **SHEET METAL PANELS, CUBICLES, ETC.**—Descriptive Booklet—"Contract Manufacturing in Sheet Metals" describes job-tailored control centers, bus enclosures, cubicles, switchgear housings, panel and various other sheet metal assemblies for utility and industrial plant applications.—THE KIRK & BLUM MFG. CO.

957 **ROTARY DUMPERS FOR MINE AND RAILROAD CARS** — Booklet 2048-A — Describes and illustrates rotary railroad car dumpers, capable of unloading open-type railroad cars at the rate of 1½ min. to a full cycle of dumping and return.—LINK-BELT CO.

960 **UNIT HEATERS**—Thermoiler Catalog—Describes the important features of Thermoiler unit heating, an economical method of adequate plant heating.—GRINNELL CO., INC.

969 **INSULATING BRICK** — Brochure IN-115A — Describes the construction, application and use of insulating firebrick, including insulating brick, hydraulic-setting refractories, aggregates and fills—for service temperatures up to 3000 F.—JOHNS-MANVILLE CORP.

984 **DUST RECOVERY** — Booklet, 32 pages—Outlines the theories and basic principles of centrifugal dust recovery, and the application of multi-clone units, with their advantages of adaptability, space saving, high efficiency and low maintenance. —WESTERN PRECIPITATION CORP.

992 **FIRE PROTECTION**—Bulletin 3219 describes Blaw-Knox Deluge systems, wet and dry pipe sprinkler systems, water spray and fog systems, rate-of-rise sprinkler systems, etc., and indicates how a sprinkler system pays for itself out of insurance savings. — BLAW-KNOX SPRINKLER DIV., BLAW-KNOX CONSTRUCTION CO.

Continued on page 102

1-54-2

Please send me without obligation, free booklets described in the January, 1954, issue of SOUTHERN POWER AND INDUSTRY as circled below.

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List Items You Want, Tear Out and Mail One of the Attached Cards Now!

Please be sure to fill in your Firm's Name and your position on the Coupon. This service cannot be extended to you unless this information is furnished.

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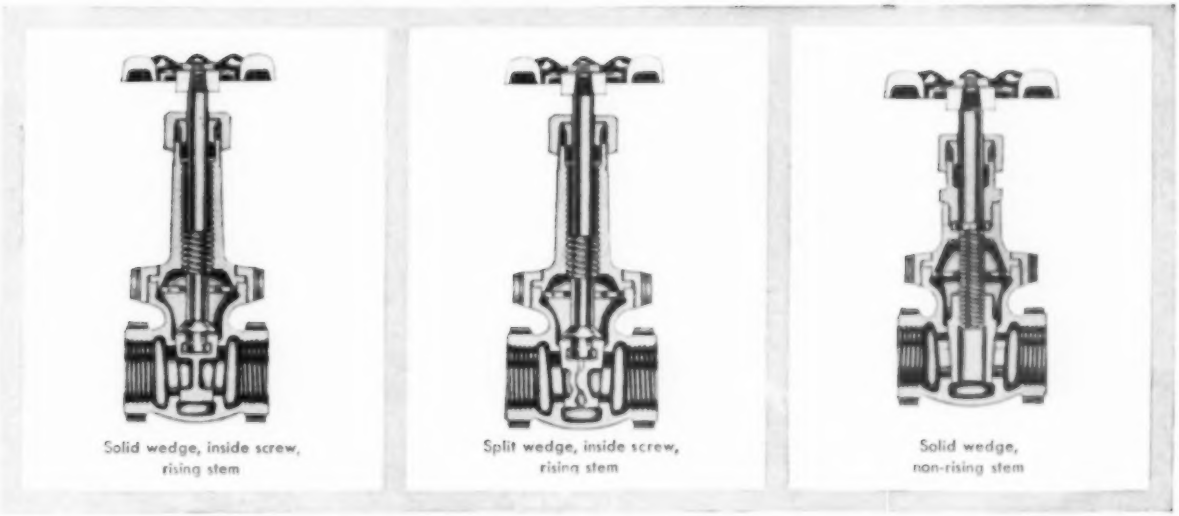
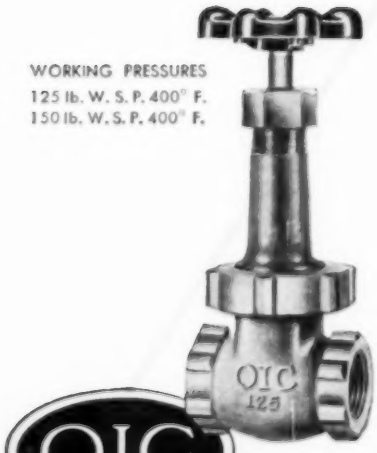


Solid wedge, inside screw, rising stem

Split wedge, inside screw, rising stem

Solid wedge, non-rising stem

. . . we've added 125 and 150 lb. bronze gate valves to our union bonnet line



WORKING PRESSURES
125 lb. W. S. P. 400° F.
150 lb. W. S. P. 400° F.

Success of our 200 lb. line of union bonnet bronze gate valves necessitates expansion of the line to include 125 lb. and 150 lb. classes. Sizes range from ¼ to 2 inches.

NOTE THESE ENGINEERING FEATURES:

This line has a flat seat on the bonnet which mates against the body, providing adequate bearing area for sealing.

Tight bonnet joint, but easy access to interior for inspection and service.

Full ports permit unobstructed flow.

Back-seating arrangement permits repacking while under pressure.

Split wedge has ball in socket contact . . . permits wedge to adjust itself to seat.

Slip-on type "T" head stem-to-wedge connection.

Lug-type hexes make valves compact and provide a better wrench-gripping surface.

To learn more about this expanding line of valves, write for our *Union Bonnet Bronze Gate Valve Catalog Folder.*

THE OHIO INJECTOR COMPANY • WADSWORTH, OHIO

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VALVES | **FORGED & CAST STEEL, LUBRICATED PLUG, BRONZE & IRON**

Durasheath: for lower-cost power distribution

DURASHEATH* is a light, tough cable. It is easily installed and thoroughly dependable for series or multiple street lighting, traffic control, and airport† lighting, residential primaries and secondaries as well as for industrial plants and railroads. It may also be used as Type USE cable for underground service entrance.

DURASHEATH cable can save you money. You can run this flexible, easily handled cable underground (buried directly in the earth), overhead or in ducts (or in any combination of these) without needless, time-consuming jointing. Its light weight and flexibility make duct pulling fast even in zero weather. Aerial assemblies go faster. Linemen like to work with it.

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As one of several types of ANACONDA power cables, DURASHEATH is available in all sizes, single or multiconductor, copper or aluminum, from 600 to 15,000 volts. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

*Reg. U. S. Pat. Off.

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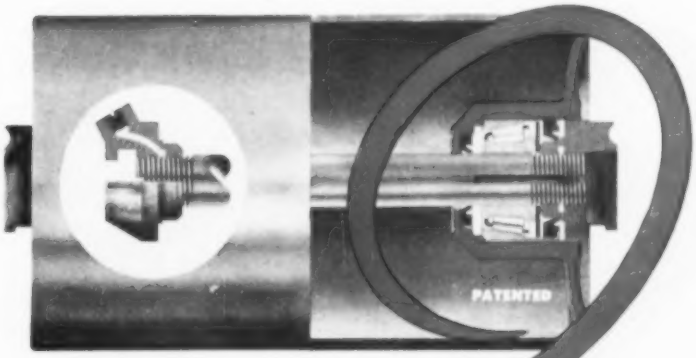
ANACONDA®

Primary and secondary distribution cables • building, machine tool, control and communication wire • portable cords and cables • bus-drop cables • apparatus cables • copper, aluminum, copperweld conductors • wire and cable accessories.

UST* Continental Idlers

*** UNIT-SEALED PRE-LUBRICATED TIMKEN BEARINGS**

Saves Grease!
Saves Labor!
Saves Belts!



STANDARD DUTY IDLER

CGC UNIT-SEALED
CGC PRE-LUBRICATED
CGC TIMKEN BEARINGS

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

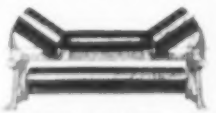
The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellent grease of a stable consistency with a wide temperature range for long life.

Most important—this construction permits operating the Continental "UST" Idler without relubrication for 1-2-3 years depending upon the severity or character of conditions.

For detailed information on these idlers write for Bulletin SI-116.

SELF-ALIGNING FLAT BELT IDLER

RUBBER DISC IMPACT IDLER



GRAIN CONCENTRATION IDLER

SELF-ALIGNING TROUGHING IDLER

***Long Life*- THE ULTIMATE IN MINIMUM MAINTENANCE**

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CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC **MANUFACTURERS**

Carroll Station Installs Conseco Non-Divided Flow Condenser

"CONSECO 6500 Sq. Ft., Two Pass, Non-Divided Flow Condenser, with bath type hot well and spring supports, installed in the recently opened . . . Carroll Station of the Iowa Public Service Company. Features of this Condenser are outside steam belt, deep water box and quick opening doors in channel covers. Also furnished with this equipment is CONSECO Twin Element, Two Stage Air Ejector. Auxiliaries include Condensate Pumps and Atmospheric Relief Valve."

CONSULT CONSECO ENGINEERS *about your condenser and feedwater heater needs. They will be glad to tell about the advanced features which assure trouble-free, low cost performance in your plant*

CONSECO

CONSECO LINE includes: BOILERS · CONDENSERS · STEAM AIR JET EJECTORS · DEAERATORS · CLOSED HEATERS

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CONDENSER SERVICE & ENGINEERING CO.

HOBOKEN, NEW JERSEY

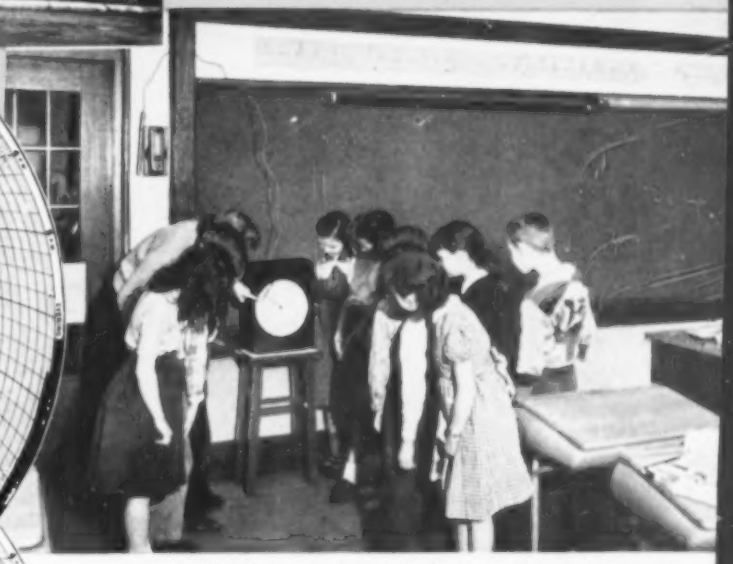
IN 1924 the BANTA SCHOOL

in Valparaiso, Indiana was equipped with

POWERS

Pneumatic System of

TEMPERATURE CONTROL



Miss Chelf, teacher and pupils in fourth grade inspecting Recording Thermometer chart record shown at left. Powers Type K Thermostat was set for 75° F. Note even control during school hours.

Chief Engineer Mr. Joseph Kutscheid setting up a Recording Thermometer in one of the rooms in the Banta School, Valparaiso, Ind. Thermostats were set for 75° F.

After 29 Years — Charts like those shown at left.

Will the Temperature Control System you are buying today give as good regulation as this when it is 29 years old?

Again and again 25 to 50 year old POWERS pneumatic systems of temperature control pass recording thermometer tests with high marks.

Why make a major investment in a control system that has no proven record for long life, low operating and low maintenance cost? Get the most for your money. Install Powers.

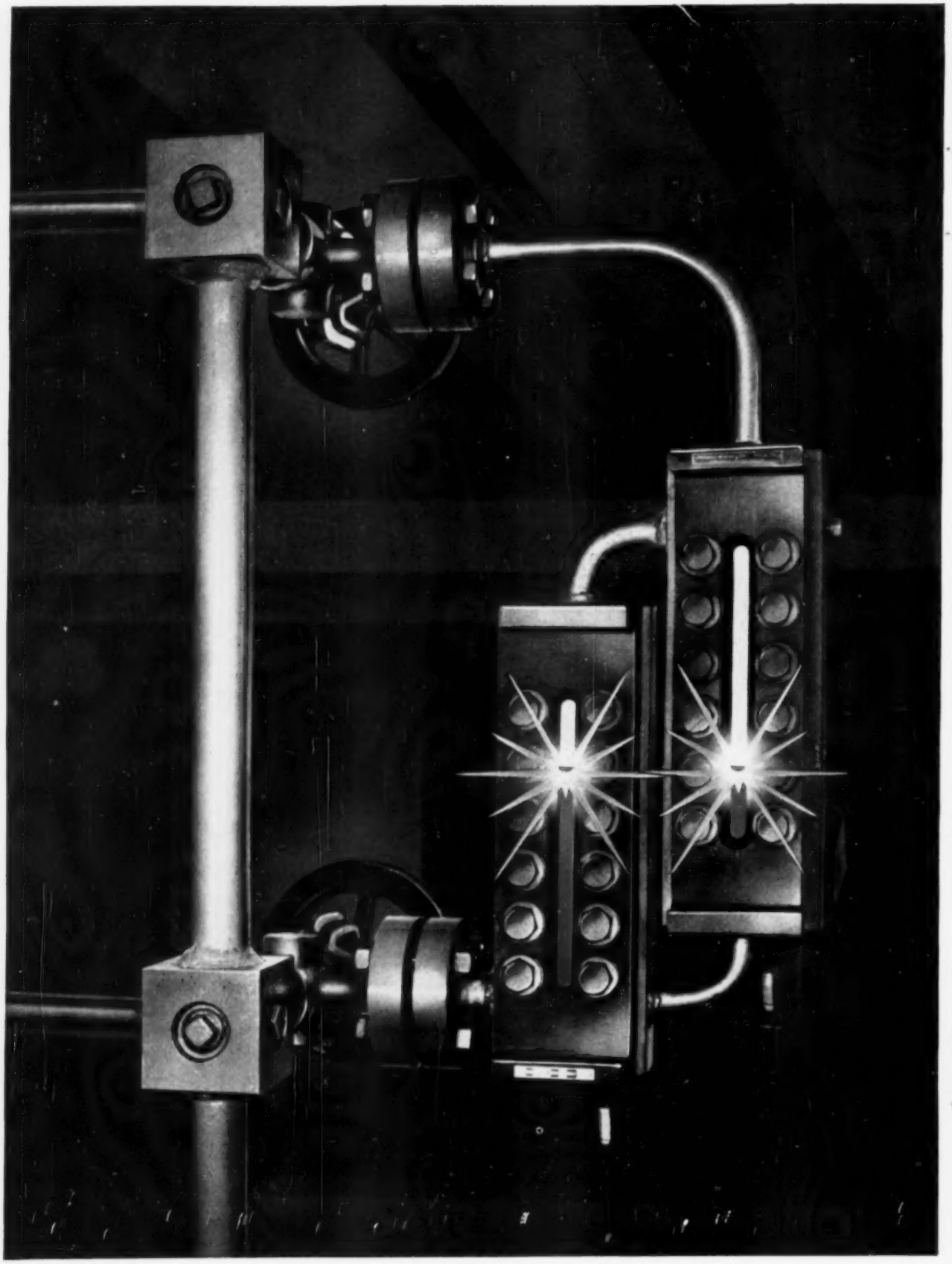
Maintenance cost on this job was 11% of the installed price 29 years ago.

(645)

THE POWERS REGULATOR COMPANY

OVER 40 YEARS OF AUTOMATIC TEMPERATURE CONTROL

1333 Spring St., Atlanta, Ga.—101 N. Elm St., Greensboro, N. C.



VISIBILITY THAT SHINES LIKE A STAR

IT'S LIGHT! IT'S BRIGHT! IT'S RIGHT!

You see instantly the accurate boiler water level in your Yarway Flat Glass Gage because *the meniscus at water level stands out like a brilliant star* . . . thanks to the Yarway Type "M" Illuminator.

The Type "M" Illuminator is specially-designed to give maximum brilliance to Yarway flat glass inserts, and to spot the water level over its entire traverse. The superior penetration of its light cuts through extraneous light, dust particles in the air, and deposits on the gage glasses. Because of its brilliance it is effective over longer distances.

LONG LIFE FOR GAGE GLASSES

The new Yarway flat glass water gage assembly was developed to meet demands for greater dependability, longer life and more accurate readings. Many hundreds of installations in high pressure plants all over the country are proving that it does all this.

Gage glass inserts are of the Yarway pressure-sealed "floating assembly" type that distributes pressure evenly, minimizing leakage and glass breakage . . . greatly extending gage glass life.

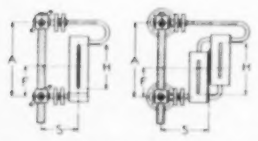
For wide ranges, greater flexibility is gained by using two independent inserts, and by interconnecting expansion loops. Other new features (1) Yarway Welbond gage valves, (2) short connection to drum assuring greater accuracy and eliminating a stuffing box on the lower connection, (3) upper flanged loop connection between insert and gage valve allows expansion and contraction of the various components, (4) tie-bar-type water column linking gage valve provides circulation to keep gage nearer drum temperature.

FOR EVERY HIGH PRESSURE BOILER

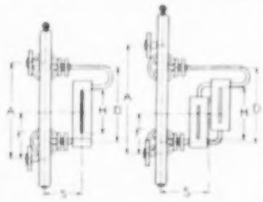
There is a Yarway Water Column and Gage combination for every boiler 600 psi and over. For full descriptions write for Yarway Bulletin WG-1811.

YARNALL-WARING CO. • *Home Office:* 116 Mermaid Ave., Phila. 18, Pa.

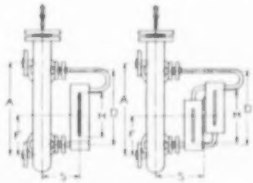
Southern Representative: ROGER A. MARTIN, Bona Allen Building, Atlanta 3, Ga.



Yarway Tie-Bar-Type Water Column with single or double inserts.

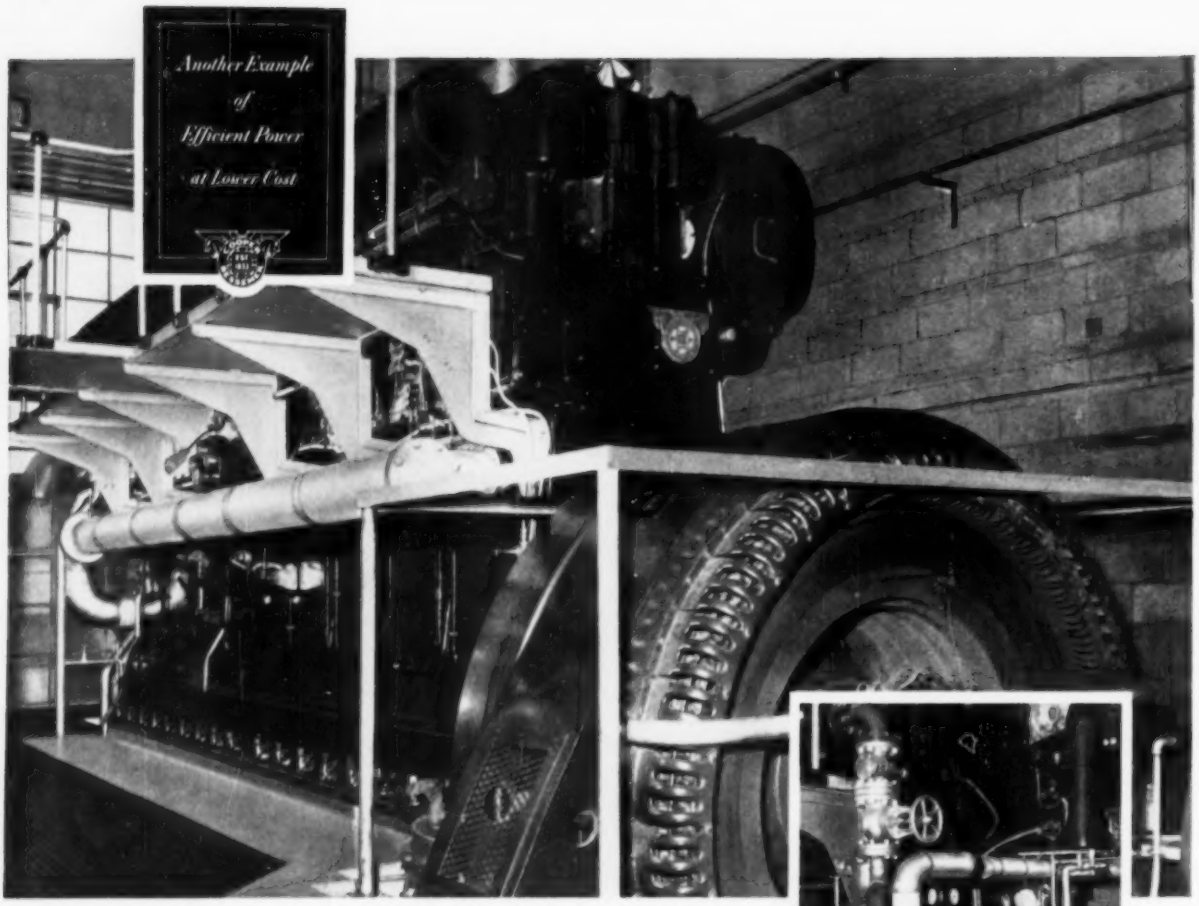


Yarway No-Alarm Water Column with single or double inserts.



Yarway 5" Hi-Lo Alarm Water Column with single or double inserts.

YARWAY® water columns and gages



Latest of three Cooper-Bessemer LS-8 diesels in International Latex plant, this supercharged 1700 hp unit provides 40% thermal efficiency. End view at right shows piping setup for jacket water heat recovery contributing to 80% over-all thermal efficiency.

How they stretch dollars at International Latex

● Here's a diesel plant that is turning in amazing results—*80% over-all thermal efficiency!* The engine is a Cooper-Bessemer supercharged LS-8, installed in the International Latex plant at Playtex Park, Dover, Delaware.

To start with, this modern LS diesel exceeds 40% thermal efficiency — performance rarely equalled! On top of that, an ingenious jacket water heat recovery system captures for processing use another 40% of the total heat input.

In all there are three Cooper-Bessemer LS-8's in this International Latex plant—the supercharged unit shown above and two previously installed atmospheric LS-8's. Later on these original LS-8's can be easily converted to supercharged operation to boost their output and to match the remarkable efficiency of the new unit.

Whatever your power needs may be, check with Cooper-Bessemer. Find out how much you stand to save by the best to be had in efficiency and long, trouble-free engine life.

The Cooper-Bessemer Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

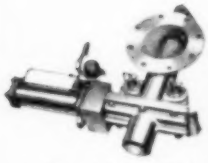
Can your ash & dust removal be improved?

Unless your plant is now enjoying the benefits of A-S-H engineering and equipment, the chances are that our pioneering experience can be of inestimable value to you.

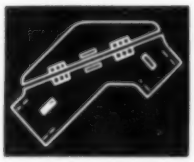
In thirty years of specialized cooperation with power engineers, we have streamlined systems to fit individual needs and developed new equipment to make them pay off in increased efficiency and lowered costs of maintenance and operation. Thousands of dollars have been saved.

Send your problem to us for analysis, and learn, without obligation, what we suggest to improve your ash and/or dust disposal. Write us today.

A few accessories to A-S-H engineering effectiveness:



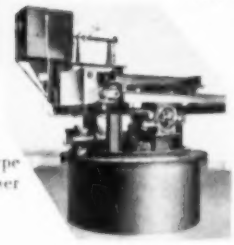
Materials-handling Valve



Ashcolite Pipe & Wearback Fitting

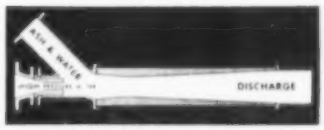
Clinker Grinder

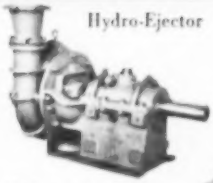
Batch Type Dust Conditioner



Automatic Sequence Head

Hydrovactor





Hydro-Ejector

Hydroseal Ash Pump

De-hydrating Hydro-bin

Continuous Vacuum Collector

THE ALLEN-SHERMAN-HOFF CO.

Dept. L — 259 E. Lancaster Ave., Wynnewood, Pa.

Offices and Representatives in Principal Cities

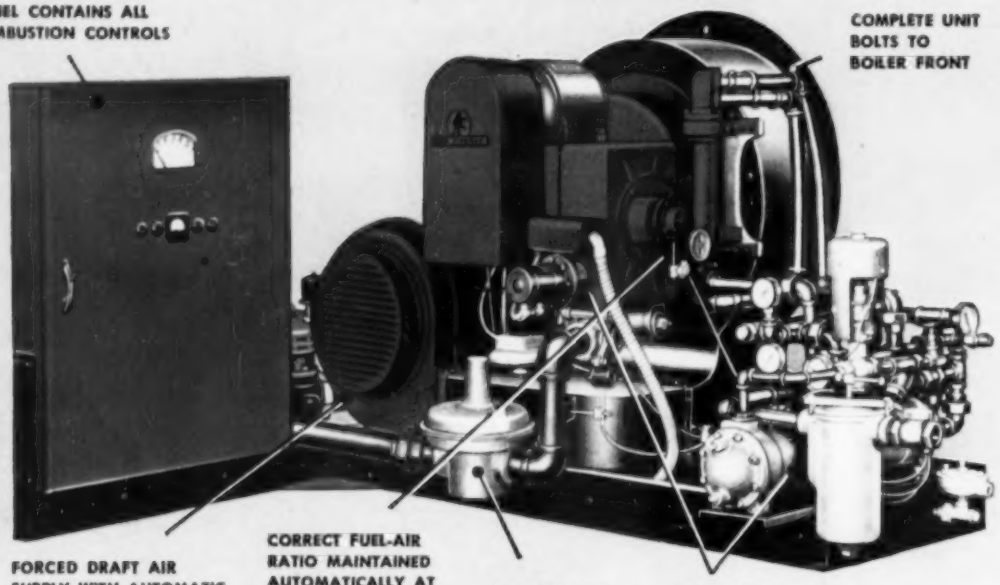
HYDROJET (hydraulic)

HYDROVAC (pneumatic)

materials handling systems

"Packaged" for better at lower cost IRON FIREMAN

FOR ALL TYPES OF POWER AND HEATING BOILERS


PANEL CONTAINS ALL COMBUSTION CONTROLS
COMPLETE UNIT BOLTS TO BOILER FRONT
FORCED DRAFT AIR SUPPLY WITH AUTOMATIC MODULATION OVER WIDE RANGE, SEALED FOR PRESSURE FIRING
CORRECT FUEL-AIR RATIO MAINTAINED AUTOMATICALLY AT ALL FIRING LEVELS
HIGH OR LOW PRESSURE GAS
OIL HEATING SYSTEM

Engineered as a single complete unit

This Iron Fireman package unit is much more than a conversion burner. It's a complete combustion system in which all elements are correctly balanced and integrated—a thoroughly engineered firing plant. It includes burner (for oil or gas or both), fuel system, forced draft air supply, control panel, and pre-formed refractory combustion throat. Installation requires little more than bolting the entire unit to the boiler front and making service connections for power and fuel.

To the user this means an attractive saving in installation time and cost. But even more important, it means a factory tested and assembled unit instead of a locally assembled job. It means dependable performance and high operating efficiency, with substantial fuel savings. It's the *smart* way to modernize your boiler room.

Get in touch with your Iron Fireman dealer, or mail the coupon on the opposite page for complete information.

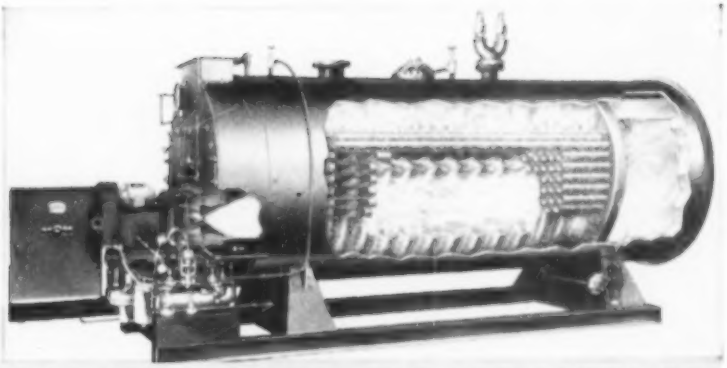
THE IRON FIREMAN

Iron

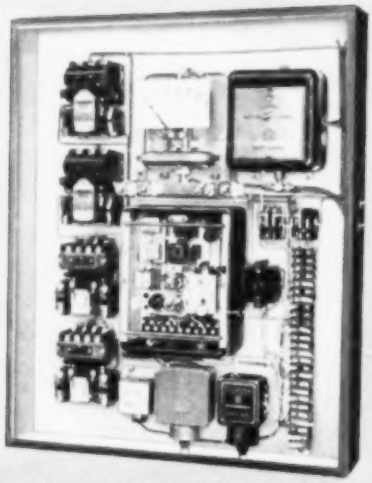
OIL, GAS AND COAL FIRING

firing

OIL, GAS or OIL-GAS COMBINATION BURNER UNIT



Cutaway view of packaged boiler-burner unit consisting of Scotch marine boiler with Iron Fireman combination Gas-oil forced draft burner. The shift from one fuel to another is accomplished quickly with no sacrifice in firing efficiency.

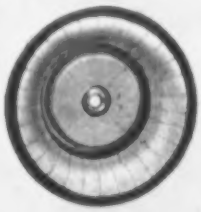


WIRED, TESTED CONTROL PANEL

Control panel is totally enclosed, with all instruments wired and tested at the factory. Entire wiring system is coded, with varicolored wires and numbered terminal strip inside panel. An indicating meter on the panel door shows the condition of the control system at all times. Indicating lights on panel front show operating status of unit at a glance. Green lights show motors in service; red indicates safety lockout.

IRON FIREMAN ROTARY OIL BURNER

The oil firing unit is the Iron Fireman rotary cup oil burner which has an outstanding record of reliability in precision firing of hard-to-handle heavy oils. Heart of the oil control system is the Iron Fireman Oil Volumeter, a variable volume metering pump submerged in the oil reservoir, which delivers the correct volume of oil to the burner head with extreme accuracy, regardless of changes in oil viscosity. Burns any grade of oil, from lightest to heaviest, without special adjustment.



REFRACTORY COMBUSTION THROAT

The combustion throat, with preformed built-in refractory, is an integral part of the burner unit. Both primary and secondary air are admitted to the combustion chamber through this throat, eliminating the special brickwork required by the usual conversion burner and greatly improving the air-fuel mixture. Oil cup is in the center of the refractory disc, which also shields the gas jets against the radiant heat of the furnace. Adjustable inlet vanes control the shape and rotation of the flame to match the requirements of the firebox or firetube.

QUICK CHECK ✓ POINTS

1. **Assembled and tested at factory instead of on the job.**
2. **Applicable to practically all types of boilers.**
3. **Continuous high combustion efficiency.**
4. **Forced draft; no high stack—requires only vent pipe.**
5. **For either gas or oil. Combination burner quickly shifted from one fuel to another.**
6. **Burns low-cost heavy oils (No. 6 or any lighter grade).**

Fireman

FOR HEATING, PROCESSING, POWER

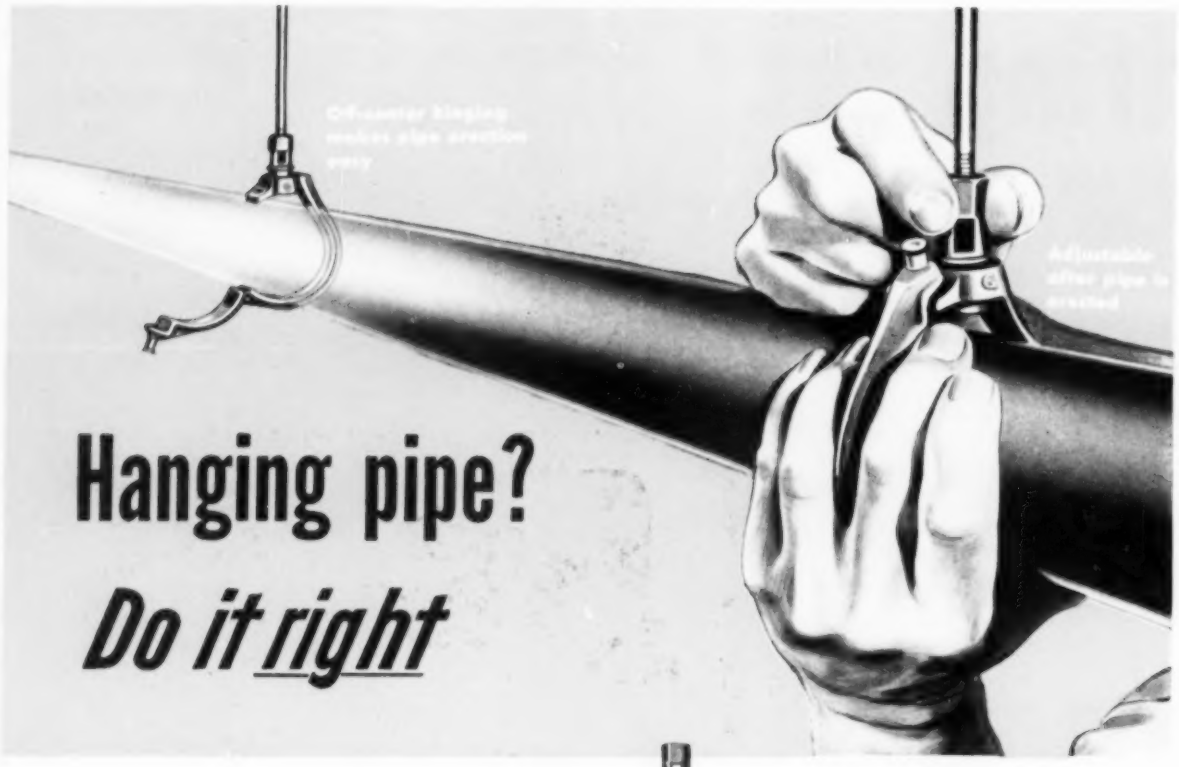
Iron Fireman Mfg. Co. 3052 West 106th Street, Cleveland 11, Ohio. In Canada, write 80 Ward Street, Toronto, Ontario.

Please send me literature giving full information on the Iron Fireman "packaged burner" unit.

Name

Address

City *State*



Hanging pipe?

Do it right

There's a stock Grinnell hanger for every piping requirement

SAVE MONEY ON ASSEMBLY. Cut installation time, get better, stronger installations, with Grinnell adjustable pipe hangers and supports.

NO SAG . . . NO WATER TRAP. Grinnell hangers permit adjustment after pipe is installed. This makes it possible to prevent sagging pipe and water traps, and assures positive drainage for the entire system.

FOR EVERY INSTALLATION. There is a stock Grinnell hanger for every need from simple water pipe to high pressure, high temperature steam line. Where necessary, there is a hanger to compensate for thermal movement.

PLAY SAFE. Don't waste time or take chances on inadequate pipe hangers and supports. All Grinnell hangers comply with rigid piping code requirements.

Enlarged section showing locking feature

GRINNELL ADJUSTABLE SWIVEL PIPE RING
(Split Ring Type)

- Hinging of ring is off-center. This provides sufficient seating to hold pipe before closing ring. Wedge-type pin is loosely but inseparably cast into the hinged section for fastening after pipe is in place.
- To obtain proper adjustment, swivel shank can be turned easily by hand when the weight of the pipe is temporarily taken off the ring.
- When weight is returned, patented swivel shank locks automatically, preventing change of adjustment due to vibration. Wire retaining ring keeps swivel shank and pipe ring or yoke from separating, makes assembly a single unit.
- 12 sizes have load range of 80 lbs. for $\frac{3}{4}$" size to 1510 lbs. for 8" size. May be used in connection with practically any building attachment.

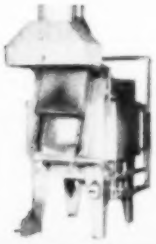
GRINNELL AMERICA'S #1 SUPPLIER OF PIPE HANGERS AND SUPPORTS

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports
Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

Conveyor brazing furnace

Batch tempering furnace

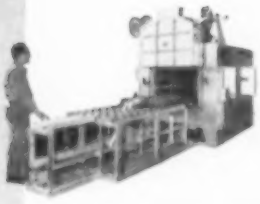


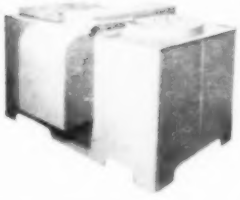
Controlled atmosphere hardening furnace (tool room)

Controlled atmosphere conveyor furnace (production)

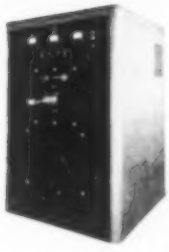
a complete line of heating and melting FURNACES

Production annealing and stress relieving furnace



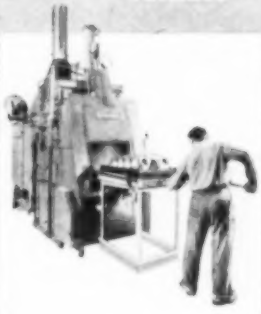


Lindberg-Fisher 2-chamber induction melting and holding furnace

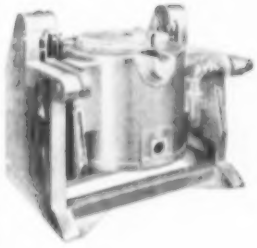


High frequency induction heating unit

Carbonitriding furnace



Fisher melting and holding furnace (gas or oil fired)



Lindberg Engineering Company manufactures a complete line of industrial heat treating furnaces, industrial melting furnaces, and high frequency induction heating equipment.

For additional information contact your nearest Lindberg office in the South

ATLANTA, GEORGIA: P. J. Duffy, 1170 Pine Ridge Road, N.E., Telephone . . Cherokee 8014

HOUSTON, TEXAS: William A. Hammer, 1406 Jefferson Ave., Telephone . . Blackstone 6287

LINDBERG FURNACES

LINDBERG ENGINEERING COMPANY 2486 WEST HUBBARD STREET, CHICAGO 12, ILLINOIS

LIMITORQUE.

...the most widely used
AUTOMATIC VALVE OPERATOR
in the world

Thousands are in operation, day and night in many of America's Leading Central Stations and Private Power Plants, from Maine to California—and too, thousands of LimiTorques are in constant use in Chemical and Process Plants; Water and Sewerage Plants; Oil Pipe Lines and Refineries—and aboard Ships.

There are *many and good reasons why* LimiTorque is *by far* the most *widely used Valve Operator* in the World. . . . Write for Catalog and you'll be convinced.

SERVING SOUTHERN INDUSTRY from LYNCHBURG, VA.
For catalogs or detailed information, write Virginia Gear and Machine Corp., Lynchburg, Va. or the address below.

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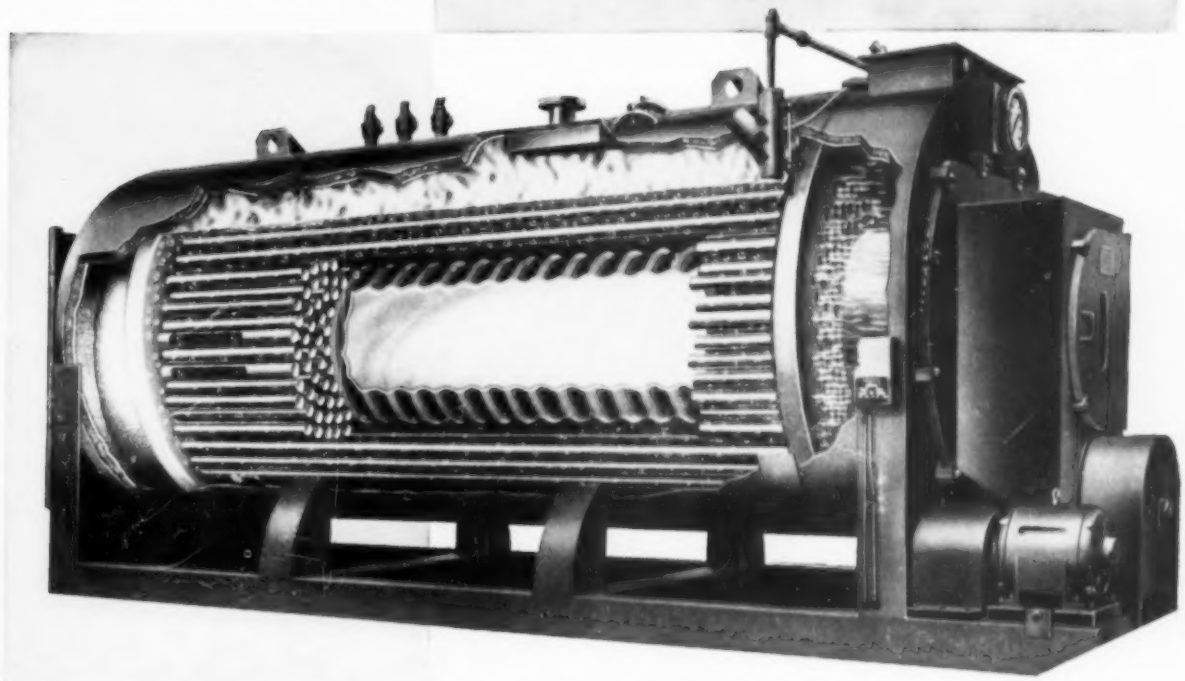
Industrial Gears and Speed Reducers
LimiTorque Valve Controls

Do You Know About *Continental's* Two Pass Design?



...and do you know it takes one man less than 30 MINUTES to open a CONTINENTAL BOILER for cleaning or inspection...

WITH THE CONTINENTAL, you get a self-contained, automatic steam generator, built of best quality steel, and featuring advanced two pass design. The two pass design eliminates baffles that may break during operation and cause gases to short circuit and destroy efficiency.

WITH THE CONTINENTAL, 80% efficiency is guaranteed. Also, the use of forced draft and the elimination of baffles results in uniform distribution of heat through all tubes... insuring long life because all tubes do equal work.

WITH THE CONTINENTAL, you'll hold boiler down-time to a minimum because the clean-out and inspection doors at both ends are hinged and can be easily opened by one man in less than ½ hour.

WITH THE CONTINENTAL, fuel is fired directly into the firing tube which is completely surrounded by water. There is no dutch-oven and there is *no* refractory-lining in the water-backed furnace. This gives you maximum heat transfer, complete combustion, a high CO_2 and a low stack temperature. By eliminating refractory in the furnace, heat is transmitted to the boiler water without being stored and wasted in heating a refractory firebox . . . Steam with less than ½ of 1% moisture is assured in high pressure boilers, and less than 1% moisture in low pressure boilers.

WITH THE CONTINENTAL, you save on fuel (U. S. and foreign patents pending on exclusive firing method). The *oil burner* uses a pressure atomizing nozzle which is easy to service—has no cups or moving parts to wear out. The *gas burner*—rather than premixing—mixes fuel and air at the point of ignition, producing a uniform, highly radiant flame.

WITH THE CONTINENTAL, you get a boiler which, before shipment, is test fired and adjusted for maximum performance. No special stack or foundation required.

Continental Boilers, for high or low pressure, oil or gas fired—or combination thereof, range from 20 to 500 hp. Write for catalog 102.

CONTINENTAL is sold, installed and serviced by competent distributors throughout the U.S.

BOILER ENGINEERING
AND SUPPLY COMPANY, INC.
8 Manavon Street • Phoenixville, Pa.
40 Years of Boiler Experience

CITY WITHOUT COAL

Without coal a great modern city is a helpless cripple. Heat. Lights. Refrigeration. Transportation. Elevators. Signal systems. Telephone. Industry. All these depend on coal.

One modern city came near such paralysis. That was Berlin in 1948 when the Russians thought to strangle it into submission. Of all the cargo flown into Berlin, 64% was coal. Nearly 1,500,000 tons. Enough to fill 30,000 big, hopper coal cars. That coal was like new blood in a dying man's veins.

We don't fly much coal here in America—occasionally to an arctic defense base or a bag dropped to a storm-isolated farm house. Coal is something we have always taken for granted. There's plenty to last a thousand—maybe two thousand years. It is widely distributed; and the great coal-hauling railroads like the C&O are equipped to move it rapidly.

For instance, the C&O has invested many millions of dollars in great coal-handling docks at Newport News and Toledo to facilitate water shipments to Atlantic and Great Lake ports.

Coal is one natural resource you don't need to worry about. It is the one fuel that will always be plentiful.

Chesapeake and Ohio Railway

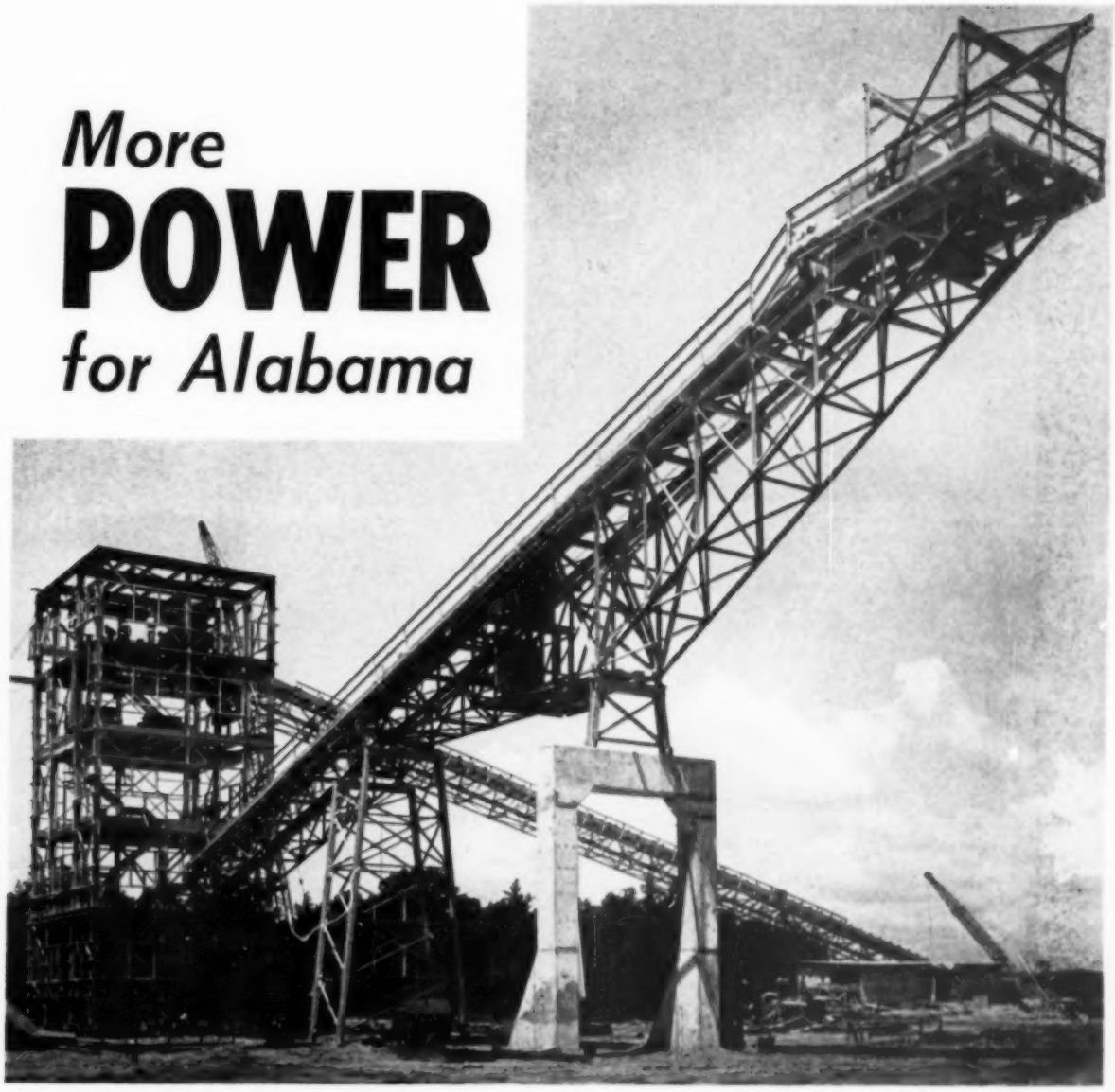
Bring your fuel problems to C & O

As the world's largest carrier of bituminous coal, the C&O is intimately familiar with every phase of coal use. We have a large staff of experts who will gladly help you to locate the coal best suited to your needs; to help you use it most efficiently; to help get it to you most economically.

Write to:
Coal Traffic Department
Chesapeake and Ohio Railway
2112 Terminal Tower
Cleveland 1, Ohio

COAL...FUEL OF THE FUTURE

More POWER for Alabama



Conveyor and crusher house of the new Barry steam plant, built for the Alabama Power Co. outside Mobile, Ala. Structural steel fabricated by O'NEAL, 800 tons.

Alabama Power Co. built with structural steel when they needed more space to generate more power. For there is power in steel itself: power to support a cantilever conveyor boom, to support massive crusher machinery at the required levels and to resist its vibrations over the years. Structural steel has the power to endure.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION INC. AISC FOUNDED 1921

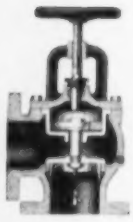
O'NEAL STEEL WORKS

Birmingham 2, Ala.

O'NEAL STEEL

6 OF THE MANY McALEAR CONTROL GUARDSMEN

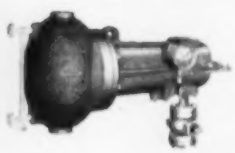
Pilot-operated pressure reducing valve for accurate control of reduced pressures . . . single seated closed valve affording dead end service.



Stop and check control — used with two or more boilers — automatic safeguard against reverse steam flow.

Suction and pressure type strainer —clamped or bolted cover—adaptable to any strainer service.

Self-cleaning "Y" strainer — used to protect regulators, pumps and traps by removing foreign matter from the line.



Feed water regulator—used for continuous feed to boiler to maintain water level. Has mercury cut-out switch as additional safeguard in case of low water.

Back pressure valve—Single seated vertical type . . . efficient—noiseless. Operates with condensing and non-condensing engines.

You can forget control problems if you REMEMBER McALEAR

There's a safe way to forget all about your control problems—just remember McALEAR. For when you use McALEAR controls you benefit from a background of fifty years of experience covering every type of installation. You know you have controls engineered to an exactness . . . controls that are just right for the specific job. You can depend on McALEAR because (1) There is an expert engineering service behind every product; (2) McALEAR sales representatives are hand picked for control know-how; (3) McALEAR controls are available through leading plumbing and heating wholesalers.

McALEAR
PRESSURE · FLOW · LIQUID LEVEL · TEMPERATURE
controls
for STEAM, WATER, AIR, OIL-GAS

McAlear Manufacturing Company
1901-1919 South Western Avenue
Chicago 8, Ill., U.S.A.

HORTON* ELEVATED TANK and 3,100 "Eyes" for FIRE Protection

Colonial Stores Inc. has installed a 100,000-gal. Horton* elevated tank at its Columbia, South Carolina, warehouse to provide a dependable secondary water supply for 3,100 sprinkler heads throughout the building. Primary water supply for the "eyes" of this fire protection system, installed by the Automatic Sprinkler Corp. of America, is provided by city mains. Backed by a water supply under dependable gravity pressure, a system of this type provides a depth of protection and will often pay for itself through reduced insurance premiums.

Horton elevated tanks for fire protection are built in standard sizes from 15,000 to 500,000 gals. Write our nearest office for further information, estimates or quotations on a Horton tank for your system. There is no obligation on your part.

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Detroit 26.....1534 Lafayette Bldg.
Houston 2.....2132 C & I Life Bldg.
Los Angeles 17...1545 General Petroleum Bldg.
New York 6.....3312—165 Broadway Bldg.
Philadelphia 3....1646—1700 Walnut St. Bldg.
Pittsburgh 19.....3252 Alcoa Bldg.
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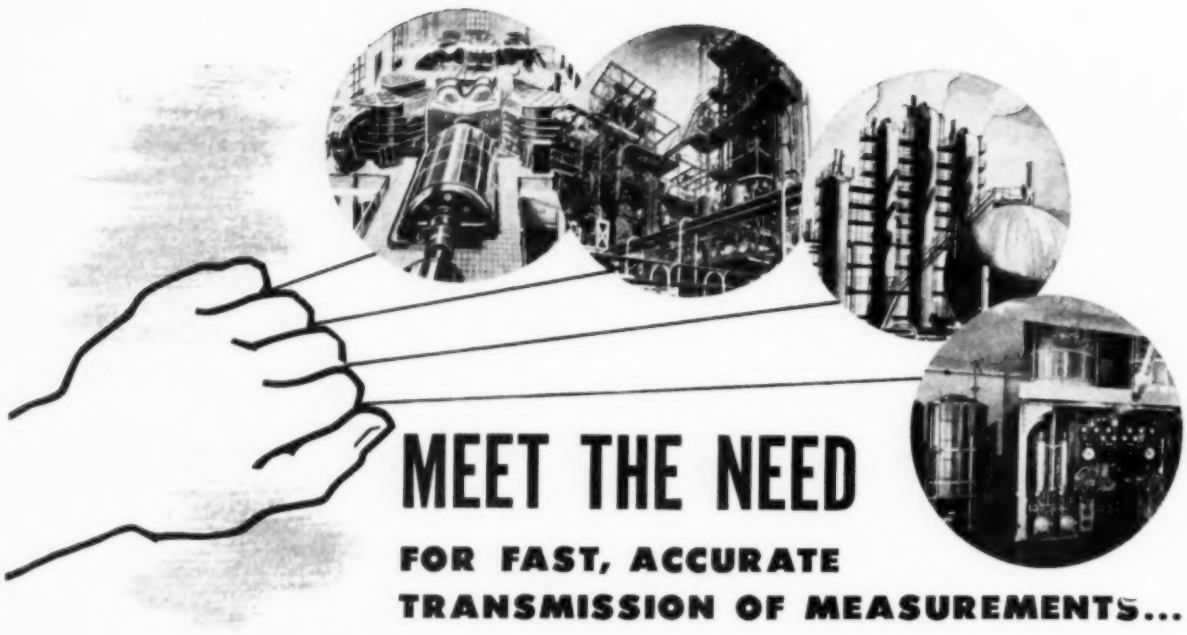
San Francisco 4.....1531—200 Bush St.
Seattle 1.....1345 Henry Bldg.
Tulsa 3.....1628 Hunt Bldg.

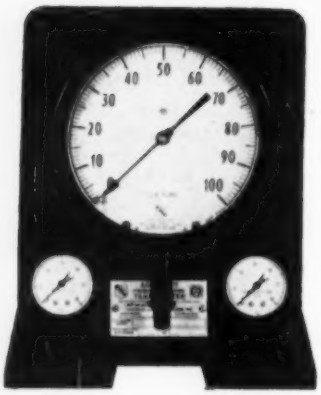
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY *and* GREENVILLE, PA. *In Canada*—HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.



MEET THE NEED

FOR FAST, ACCURATE TRANSMISSION OF MEASUREMENTS...

ASHCROFT PNEUMATIC TRANSMITTERS



ASHCROFT PNEUMATIC PRESSURE TRANSMITTER with two 2-inch gauges, one reading "Air Supply," the other "Transmitted Air." Other types available for temperature, differential pressure, flow and liquid level.

Measurements of pressure, temperature, differential pressure, flow and liquid level must be transmitted quickly, accurately and safely to assure the efficiency required by modern process engineering. Ashcroft Pneumatic Transmitters more than fill those requirements—contribute greatly to the perfect performance demanded of vital instrumentation at one or more remote control centers.

Ashcroft Transmitters are ideal for all process industries and power stations—wherever it is desirable to confine high pressures or inflammable, poisonous or corrosive liquids and gases close to their source. They are also highly suitable where fire or explosion hazards make electrical wiring objectionable, or where the existing source of compressed air can easily be used.

Built into Ashcroft Transmitters are many design advantages proved through years of experience in manufacturing pressure gauges. They operate on low-pressure air—transmit proportionate air pressures to one or more pressure-actuated receiving indicators, recorders and controllers up to 1000 feet away with accuracy within ½ or 1%. Expensive, high-pressure lines and fittings, with all their leakage and maintenance problems, are avoided.

Write for details about Ashcroft Pneumatic Transmitters. Or ask your nearby Instrument Distributor for complete data on all types.

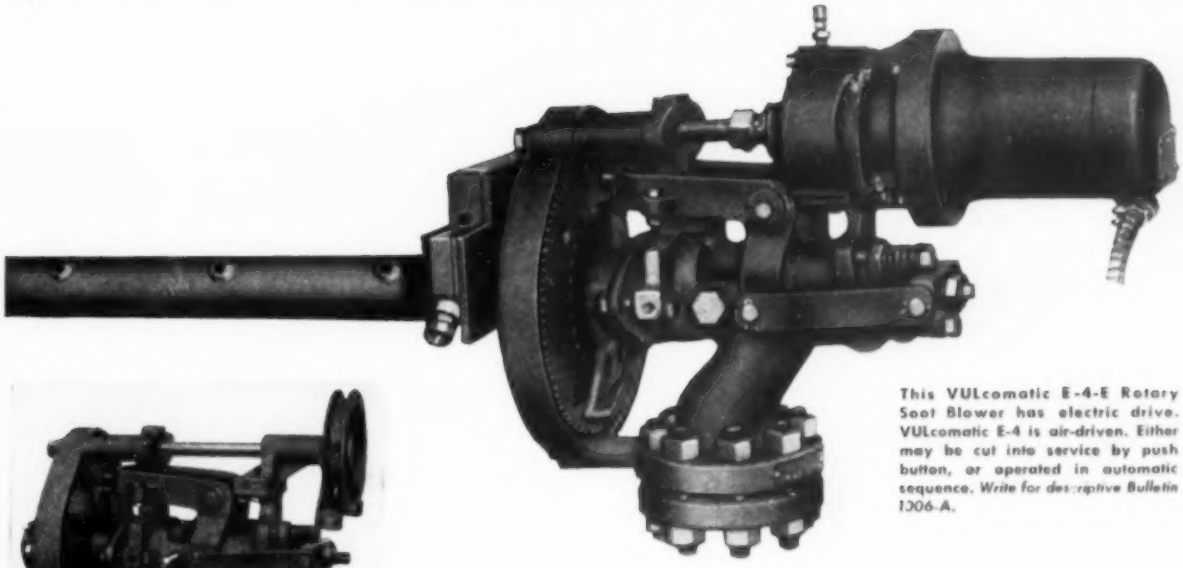
YOUR INSTRUMENT DISTRIBUTOR carries Manning, Maxwell & Moore products because he wants to be sure you get the best in quality, performance and economy. You can depend on him for prompt service.

ASHCROFT GAUGES

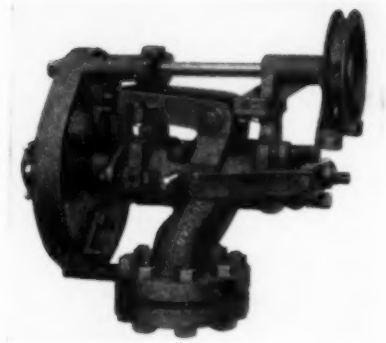
A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT

MAKERS OF 'ASHCROFT' GAUGES, 'HANCOCK' VALVES, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN' INDUSTRIAL INSTRUMENTS. BUILDERS OF "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES.

Here's the answer to SOOT *and* DUST REMOVAL



This VULcomatic E-4-E Rotary Soot Blower has electric drive. VULcomatic E-4 is air-driven. Either may be cut into service by push button, or operated in automatic sequence. *Write for descriptive Bulletin 1006-A.*



Manually-operated Vulcan P-3 is identical with VULcomatic E-4-E or E-4, except for drive. May be quickly converted to an automatic unit by replacing sheave wheel with air or electric motor. *Bulletin 1005-A.*

MOTOR DRIVE or MANUAL

With Vulcan Rotary Soot Blowers, you get full cleaning pressure—from the crack of the valve to the end of the cycle. Exclusive trigger-action valve assures uniform speed of rotation for better cleaning, and closes automatically. While closed, it seals off corrosive furnace gases to protect internal parts. You can install Vulcan Rotaries at any angle. You can inspect or repair any part—with an ease that saves maintenance time and money.

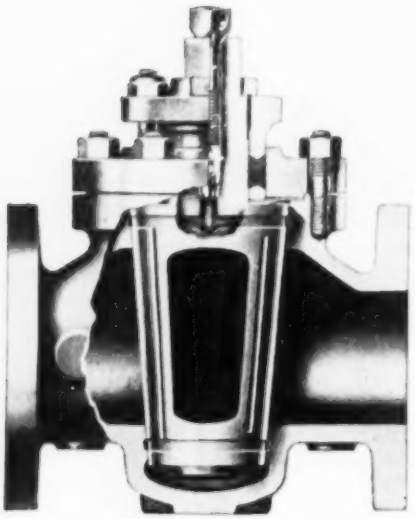
COPES-VULCAN DIVISION
Continental Foundry & Machine Company
ERIE 4, PA.

VULCAN Rotary SOOT BLOWERS

WALWORTH

Lubricated

Plug Valves



for TOUGH *assignments*

where tight shut-off...
and easy operation
are "MUSTS"

Walworth Lubricated Plug Valves Offer These Advantages

- Complete surrounding of ports with resistant lubricant affords positive seal against leakage.
- Lubricant grooving system assures ease of operation – tight shut-off – greater protection against corrosion.
- Body and plug fully protected by lubricant from attack by line fluids.
- Quarter turn opens or closes valve.
- Made in a complete range of sizes ½" to 26" and for pressures from 175 to 5,000 psi., and for vacuum requirements.

For handling petroleum products, natural or manufactured gas, acids, alkalies, solvents, slimes, slurries . . . in fact for almost any hard-to-handle liquids – there's a Walworth Lubricated Plug Valve designed for the job.

Easy to operate, tight sealing, resistant to wear and corrosion, Walworth Lubricated Plug Valves assure long years of dependable service at low operating cost.

Walworth Lubricated Plug Valves are available in sizes ½" to 26" for pressures from 175 to 5,000 psi., and for vacuum requirements. For full details – prices, sizes, dimensions, and other pertinent data, see your Walworth distributor or write to:

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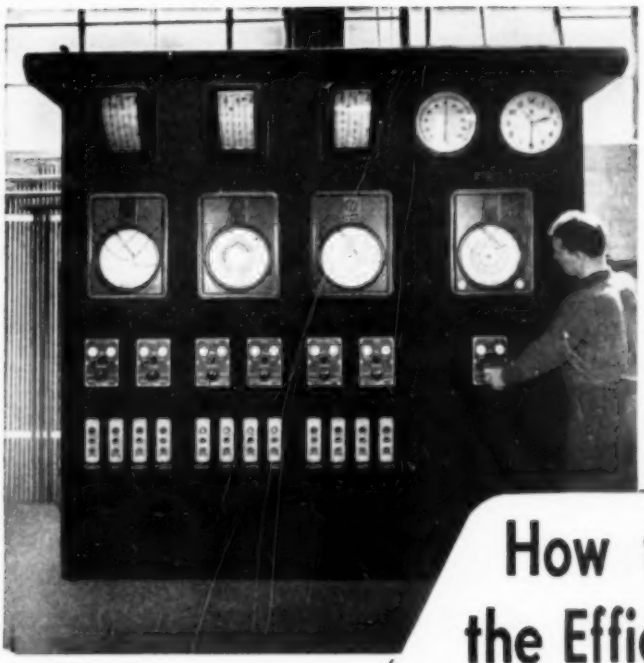
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD



These Bailey Boiler Controls at the Chicago Pneumatic Tool Company's new plant in Utica, N. Y. insure efficient operation of three 25,000 lb per hour, 100 psi, spreader stoker-fired boilers.

How to INCREASE the Efficiency of YOUR BOILER-ROOM DOLLAR

Before you get steam you've got to spend dollars—so dollars are a form of energy.

And if your boiler-room dollars are invested in equipment that isn't working efficiently, economically, your "investment" is poor.

That's where co-ordinated controls by Bailey can help. Here's why they'll increase your "boiler-room investment efficiency":

1. **Complete Range of Equipment—fully co-ordinated.** You need never worry that a Bailey Engineer's recommendation is slanted in favor of a particular type of equipment, just because he has a limited line to sell—or that Bailey will pass the buck for efficient control; we offer *complete* boiler control systems.

2. **Engineering Service—backed by experience.** No other manufacturer of instruments and controls can offer as broad an experience, based on successful installations involving all types of combustion, flow measurement and automatic control.

3. **Direct Sales-Service — conveniently located near you.** Bailey Meter Company's sales-service engineers are located in more industrial centers than those of any other manufacturer of boiler control systems; you get prompt, experienced service with a minimum of travel time and expense.

•

For better "boiler-room investment" efficiency—for more power per fuel dollar, less outage and safer working conditions, you owe it to yourself to investigate Bailey Controls. Ask a Bailey engineer to arrange a visit to a nearby Bailey installation. We're proud to stand on our record: "More power to you!"

A-111-G

BAILEY METERS

BAILEY METER COMPANY

1028 IVANHOE ROAD
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Controls for Steam Plants
COMBUSTION · FEED WATER
TEMPERATURE · PRESSURE
LIQUID LEVEL · FEED PUMPS

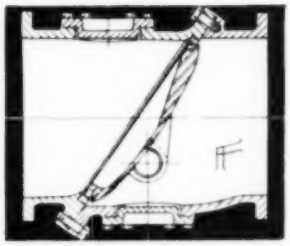
QUIET

Do Not Disturb Pipelines

You hang this sign on every line, when you install Chapman Tilting Disc Check Valves. For these unique check valves don't slam or hammer, under usual piping arrangements. And that means no damage to pipeline joints . . . virtually no wear in the valve itself.

Cross section at the right shows you how the airfoil design of the disc makes these valves *keep quiet* all their working lives . . . shows you why, in any installation, head loss is reduced over regular swing-type checks. Send for Publication No. 30, showing charts of test-results at leading engineering laboratories. Write today.

The Chapman Valve Manufacturing Co.
INDIAN ORCHARD, MASSACHUSETTS



Here's why
CHAPMAN Tilting Disc Check Valves
***Keep Quiet* All Their Lives**

This specially designed "airfoil" disc balances perfectly in open position . . . then drops easily to closed position (cushioned by the flow). No jarring or slamming, in usual pipe-layouts. Write for bulletin.

CHAPMAN (TILTING DISC) **CHECK VALVES**

Timely Comments

The Don't-Do-It-Yourself Idea

While the do-it-yourself trend is a consumer movement, the don't do-it-yourself idea is even more important in business and industry.

YOU MAY shine your own car, paint your own canvasses, or hone your own tools, but when something important happens you want a specialist—a surgeon for your appendix, a dentist for your teeth or a lawyer for litigation.

So it is with industry—a company will turn out pistols or pistons, carborundum or carbons, with all the perfection and precision necessary to compete in the market; but when law, taxes, auditing, advertising and other professional matters arise, companies just don't do it themselves.

Not doing things for oneself benefits industry, according to a recent issue of the *York Report*, published by the York Engineering & Construction and York-Gillespie Manufacturing companies of Pittsburgh, because specializing organizations can often do things cheaper as well as better than a company can do them for itself.

What About The Executive?

The report asks what happens to the executive whose plant is cleaned by a cleaning company, whose analyses are made by independent laboratories, and whose speeches are written by someone else. He is free of picayune details. He has escaped the danger of being spread too thin. Instead of being a "jack of all trades," he can be a master of management.

Smaller capital requirements is another vital benefit in less doing-it-yourself in industry. Using the laboratories of consulting chemists or the plants of professional engineers can reduce capital facilities requirements for any firm. So can renting equipment and plants, or franchising others to make an item.

Other monetary gains than savings in taxes, overhead and investment are possible. Specialists, because they are specialists, can often solve problems in design, personnel, and safety cheaper than the client company can. The finest managerial brains in the world may hem over a problem in distribution that marketing men can solve in minutes, or haw over a question of handling a reluctant material that would be no trouble at all to engineers in that field.

There are other advantages for companies of all sizes in not doing it themselves. By reducing capital outlays and making other savings by turning complicated problems over to specialists, a company may be able to shave costs enough for vigorous competition ahead. It can share in the scientific and technical skills of specialists it might not be able to afford as full-time employees.

A firm with fewer than 100 employees just can't hire all the specialists it ought to have. But it doesn't have to. A small company can turn to fee-basis services and obtain talents that are comparable to those large corporations get in salaried departments. And for the end results, a small company may pay proportionately less.

Most Obvious Advantage

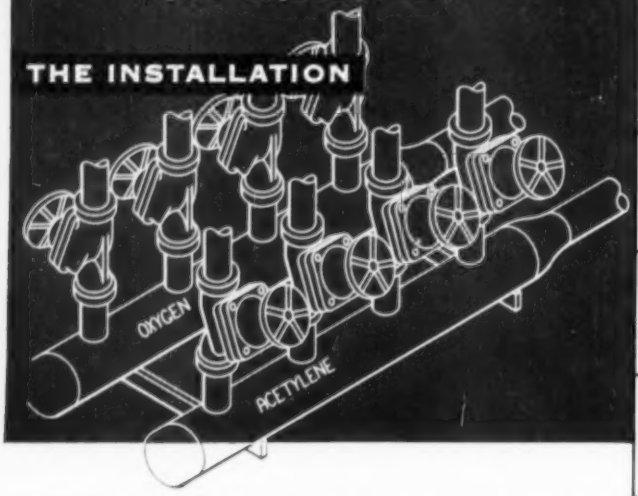
By getting others to do things they can do best, management is freeing itself from a tangle of petty responsibilities. It cannot ignore work turned over to other organizations, of course. But it can assume a true managerial attitude toward such tasks, escaping dangers of being bogged down in detail. Management can be general officers, not just sergeants.

Another advantage that defies measurement in dollars or dividends is the speed that can come from letting others do things they are best equipped to do. Outward contracting may accomplish in months what inward training might take years to complete.

This Valve Stops Hidden Losses

...in Welding Gas Systems, for instance

THE INSTALLATION



In a prominent New Orleans shipyard, with Crane Diaphragm valves listed as "standard operating procedure" for complete oxygen-acetylene system. Shown is typical installation on portable manifold.

VALVE SERVICE RATINGS

SUITABILITY:
100% effective – no leakage

FEATURES:
No seating stress on diaphragm

MAINTENANCE COST:
Zero

SERVICE LIFE:
Installed 2 yrs. – long life indicated

OPERATING RESULT:
Big savings on welding gas costs

AVAILABILITY:
Crane Catalog item – No. 1652

THE CASE HISTORY

Costly loss of welding gases was traced to the conventional packed valves formerly used on the system. Leakage through the stuffing persisted despite frequent, regular servicing of stem packing on the valves. This high maintenance cost added to the yard's loss.

The remedy was found in Crane No. 1652 packless Diaphragm Valves, Underwriters approved for the service. These valves stopped the leakage, and not one Crane valve has needed attention since installed more than 2 years ago. Despite continued expansion, the yard's costs for welding gas have been sharply reduced.

THE VALVE

The modern packless valve with Neoprene diaphragm that serves only to seal the bonnet. Its independent disc saves diaphragm wear, provides positive seating on fluid, even should the diaphragm fail. Choose from a wide range of body and trim materials for all kinds of corrosive and ordinary services. Sizes ½ to 6 in.; screwed or flanged ends. See your Crane Catalog, or your Crane Representative.

THE BETTER QUALITY... BIGGER VALUE LINE... IN BRASS, STEEL, IRON

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

Industry Speaks

The Washington Trend

Morning Traffic Peak 25 Minutes Earlier

FOLLOWING are some of the changes that have taken place in Washington, D. C., in the last year, according to R. C. Sollenberger, executive vice president of the Conveyor Equipment Manufacturers Association, who lives there.

"The morning traffic peak across the 14th Street Bridge over the Potomac now occurs 25 minutes earlier than before January, 1953.

"The government now owns 1,380 fewer automobiles.

"It used 3 million square feet less office space.

"It has 148,000 fewer employees.

"It uses 120,000 pounds less coffee per month in government cafeterias.

"A year ago I always got a choice seat on my 7:30 A.M. bus, but not anymore, and usually several loaded buses pass me up. There is a strong movement to eliminate the many temporary buildings along the mall—some of which were temporary in World War I."

Mr. Sollenberger spoke at a meeting of materials handling engineers at the Kentucky Hotel in Louisville.

Training For Top Jobs

Less Pressure Urged; Tailor Your Program

INDUSTRY'S efforts to provide extensive and intricate training programs for executives may overburden the prospective top managers of industry and do more harm than good, business leaders attending the fall conference of the Society for the Advancement of Management were cautioned recently.

More than 1,000 executives meeting in New York heard James S. Massie, of Minneapolis-Honeywell Regulator Company's Micro division, emphasize that management programs must be tailored to the individual needs of the potential executive. Group programs, he said, should be conducted only where there are indications of compatible group interest.

Of 250 top executives questioned, each of whom had risen within the last three years from the middle management ranks, 95% said they had undertaken some form of self-improvement in the past five years, and all had future plans for such programs. The average executive in this study was a man of 45, with his present company an average of six years. Massie stressed this evidence of an urge on the part of top-management candidates themselves for learning their way to the next higher position.

His study also furnished an indication as to which areas the executives felt most needed "polish." For example, some 60% indicated they needed assistance in encouraging staff teamwork; 65% admitted having poor memories; 50% wanted polishing on their conference leadership techniques; 50% also indicated that they wanted more knowledge of business economics, finance and a better understanding of business organization and policies.

Industrial Progress

$8 Million Program Is South's Secret Weapon

THE industrial progress of the South is being promoted through a multimillion dollar program which constitutes a little-publicized "secret weapon" in economic competition with other areas. Speaking at the seventh annual conference in Asheville, N. C., of the Southern Association of State Planning and Development Agencies, H. McKinley Conway, Jr., reported that the efforts of local, state and regional groups in industrial promotion now involve an annual gross budget of more than $8 million and several hundred trained staff workers.

"Southern economic progress is neither accidental nor inevitable," Conway said. "Nor is it dependent on Federal aid." It is the result of an intensive, well-directed research and development program, he asserted.

Conway is regarded as a spokesman for the region in industrial and technological affairs. He is director of the Southern Association of Science and Industry and Editor of the Journal of Southern Research, with offices in Atlanta, Georgia.

Close control of steam pressure in Carolina textile mill . .

Solving GAS CONVERSION Problems

CONE MILLS CORPORATION and the Cone Finishing Company have five mills in Greensboro, North Carolina, which are served from one central boiler plant.

Use of this "one plant location" as a central metering point in the natural gas firing conversion, simplified the installation and kept the cost of service at a minimum.

Conversion of this plant, rated at nearly half a million lb/hr, is the largest to date in the Piedmont Carolinas.

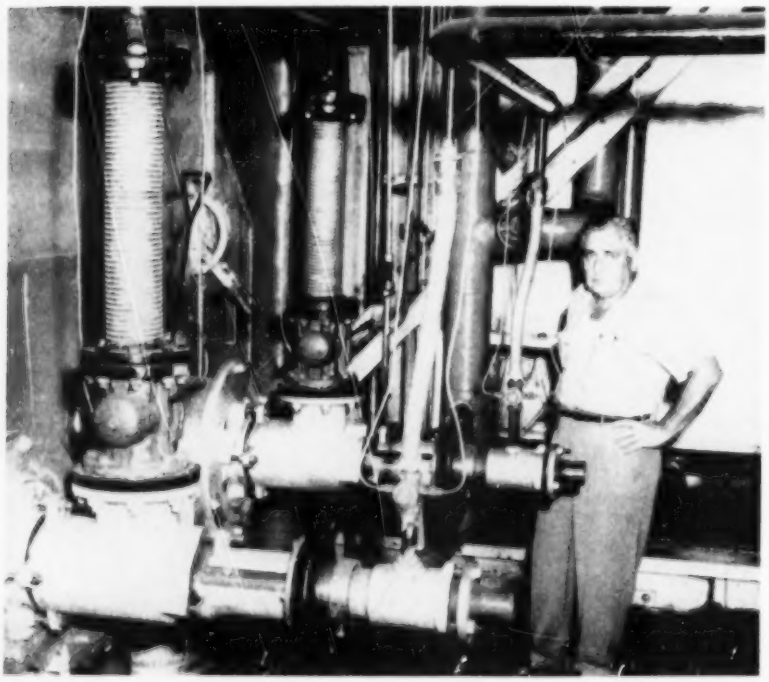
MAJOR ENGINEERING PROBLEMS included:

1. Conversion of four water tube boilers from pulverized coal to natural gas; burners and controls to be adaptable to the present boiler and other equipment already in use.

2. Equipment to be flexible, so that conversion from one fuel to another could be accomplished whenever required, with a minimum of inconvenience and with no delay.

3. Installation of pressure regulation and metering equipment. Volume of gas required, 13,000 mcf per day, peak; minimum monthly bill, 100,000 mcf.

By JOHN G. HOPPING, Industrial Engineer
Piedmont Natural Gas Company, Inc., Charlotte, N. C.

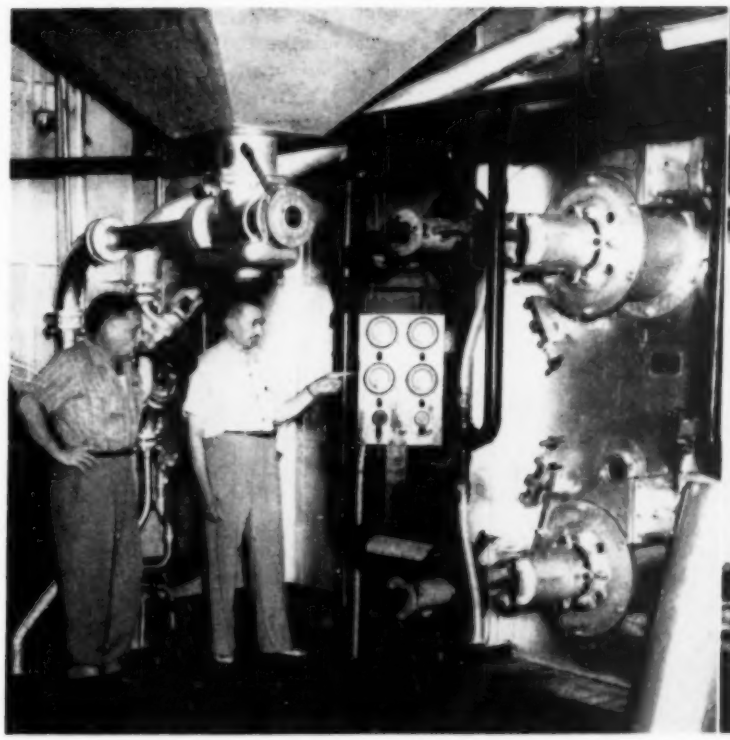


TWIN BURNER installation on the 90,000 lb/hr boiler is being checked by John G. Hopping, Piedmont Natural Gas Company. Burners have a capacity of approximately 65,000 cu ft of gas per hour each, at 15 lb pressure. Note flex couplings on pilot and main burners for adjusting burner position.

THERE ARE four boilers installed in the Cone Mills plant. Three have a normal rating of 90,000 lb/hr each; while the fourth is rated at 150,000 lb/hr.

A careful inspection revealed that no trouble would be experienced in converting these boilers from pulverized coal to natural gas, and it was determined that a reasonably higher efficiency could be reached through a wider firing range than had been obtained from pulverized coal.

The Piedmont Natural Gas Co., who assisted Mr. C. E. Kerchner, Superintendent of Power at Cone Mills, in the selection of equipment and preparation of specifi-



HIGH AND LOW PRESSURE CUT-OFF CONTROLS are pointed out by C. E. Kerchner, Superintendent of Power, Cone Mills Corp. Manifolds on pilot and main burners can be seen.

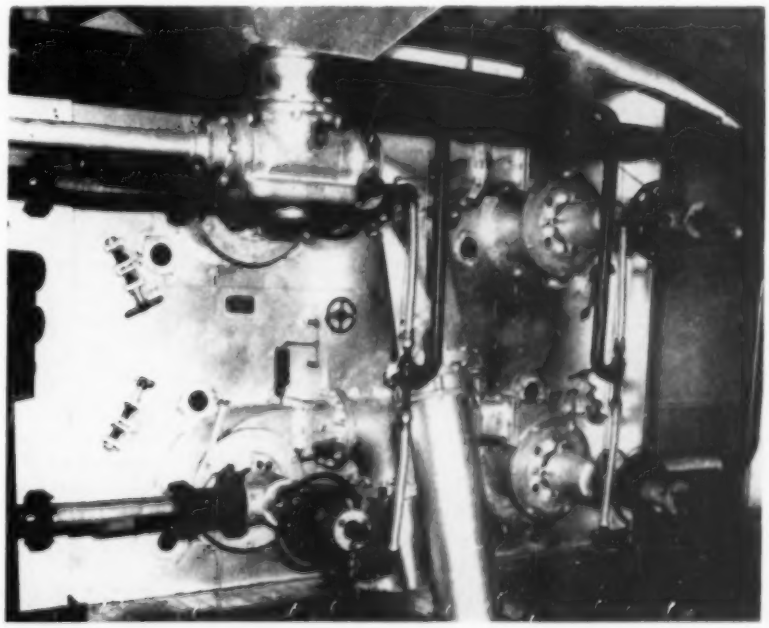
SAFETY AND CONTROL EQUIPMENT is being examined by C. E. Kerchner (left) and John G. Hopping

cations, kept in mind that it would be desirable to continue the use of their present control and recording instruments wherever possible.

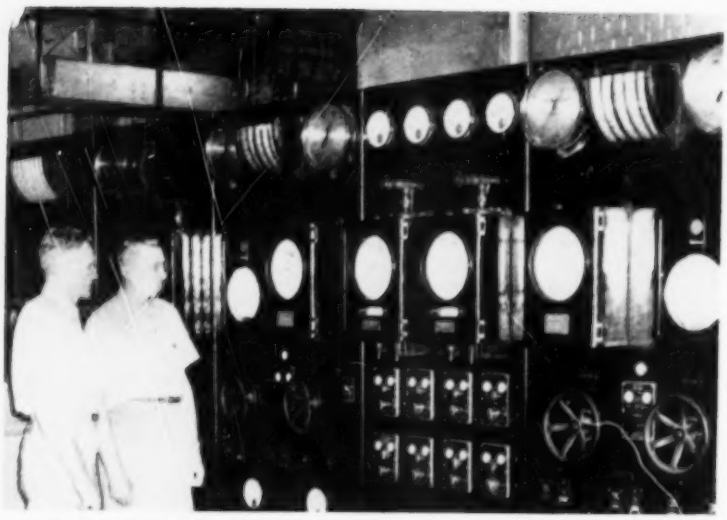
Control Changes

The existing control equipment was pneumatically operated, with an individual set of controls for each boiler. When operating on coal, the controls required higher air pressure than is needed with natural gas. It was merely necessary to valve these air lines in such a manner that a selector switch mounted on the control panel could place the controls in operation on either coal or natural gas. The only additional change in the pneumatic controls was the installation of a pressure reducing valve, to reduce pressure to the proper range for the operation of the natural gas controls. A precaution along these lines was to prepare a drawing of the sequence of controls, the method

SP&I Staff Photos



FOUR BURNER installation. Burner barrel diameter of 6" permits pilot to be inserted through to the throat of the burner, making natural gas pilots available for pulverized coal when desired. Gas burning equipment can remain in place even though boilers are being coal fired.



CONTROL PANEL in Cone Mills' boiler room. R. W. Tucker, Shift Foreman, and C. E. Kerchner, Supt. of Power, at the right.

of piping, and the safety equipment to be installed. This was submitted to the insurance company, whose approval was obtained before purchases were made.

Burner Design

Several features and characteristics of the burners are unusual. The burner barrel size was increased from 4 to 6" in diameter. This permits the pilot to be inserted through to the throat of the burner, making the natural gas pilots available for pulverized coal if desired. Another feature of this arrangement is that it allows the gas burning equipment to remain in place even though the boilers are being fired on coal. These burners have a capacity of approximately 65,000 cu ft of gas per hour each, at 15 lb gas pressure.

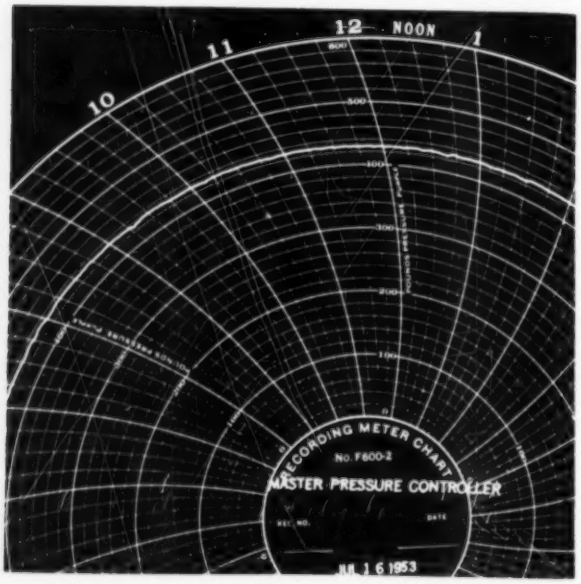
As the boilers were installed many years before natural gas was considered as a fuel for the Piedmont area, no thought was given to its use. The three 90,000 lb/hr boilers had only two coal burners each, while the 150,000 lb/hr boiler had four. This is the reason for the extra-large capacity per burner. With a newer installation, designed for conversion to natural gas, it would be normal to expect that several additional burners per boiler would have been used. However, because of furnace design, induced draft fans, etc., it was necessary to obtain the same capacity on gas with the existing number of burners, for which the boilers were originally designed.

Additional gas controls which were mounted on the control panel are selector switches to place the equipment on either automatic or manual control. Another selector switch mounted on the panel will automatically change the controls and recording instruments to accommodate the fuel being used. A gas volume recording meter is located in the immediate vicinity of the steam flow meter on each boiler panel board.

Equipment Flexibility

It was highly desirable that the equipment lend itself to firing with either coal or natural gas, with a maximum of convenience and flexibility, so that the plant might burn all of the gas available at any time. The equipment which was installed is capable of burning pulverized coal in any given number of burners on a boiler, with the balance of the burners on natural gas. In other words, with four burners on a boiler it is possible to have any number on natural gas, with the rest burning coal. The obvious

(*Continued on page* 64)



CLOSE STEAM PRESSURE CONTROL is evident from this portion of a master pressure controller chart.

Principal Conversion Equipment

Gas Burners ..... Special design; 8 by Combustion Engineering, Inc., for C. E. boilers; 2 by Babcock & Wilcox Co., for B & W boilers.

High and Low Pressure Switches. The Mercoid Corp.

Cut-off and Firing Valves ..... Nordstrom Corp.

Manual Reset Valves ..... General Control Co.

Gas Pressure Regulators ..... Fisher Governor Co.

Controls and Recording Instruments ..... Bailey Meter Co.

Pipe Work ..... Industrial Piping Co., Charlotte, N. C.

Engineering ..... C. E. Kerchner, Superintendent of Power, Cone Mills Corp.; and John G. Hopping, Piedmont Natural Gas Co., Inc.

EMPLOYEE OPINION

Summary of Surveys Made for Seventy-five Southern Plants

By GUY B. ARTHUR, JR.
Guy Arthur & Associates
Toccoa, Georgia

How do Southern employees rate the plants in which they work? Here is the answer as a whole, but each plant presents a challenge and an opportunity. Accurate surveys can help establish an effective improvement program.

BECAUSE our reports on *employee opinion surveys* are confidential, results for individual organizations are not revealed, even to our other clients. For obvious reasons, very few managers would have us make studies of their organizations on any other basis. Yet, some knowledge of conditions in comparable plants is of real value in interpreting the meaning of specific surveys for individual plants. It is impossible to determine whether employee attitude in a given plant is good or bad, unless some type of average is available for comparison.

That is the reason we prepared the accompanying summary of "Employee Opinion" reports on the many plants we have surveyed. The data presented can serve as a type of "yardstick," without revealing confidential data on any plant.

During the past seven years we

Do you advise your friends to come to your plant for a job?

As a company to work for, compared to other companies, is your company above average?

Do you get information promptly which affects you and your work?

Do you get enough information about the company, its plans and its policies?

have made objective employee opinion surveys for many companies, large and small. Each survey was planned for the specific company, and designed to provide information needed for evaluating personnel programs, setting up training programs, improving communications, learning why employees might be interested in unions and strengthening employee relations.

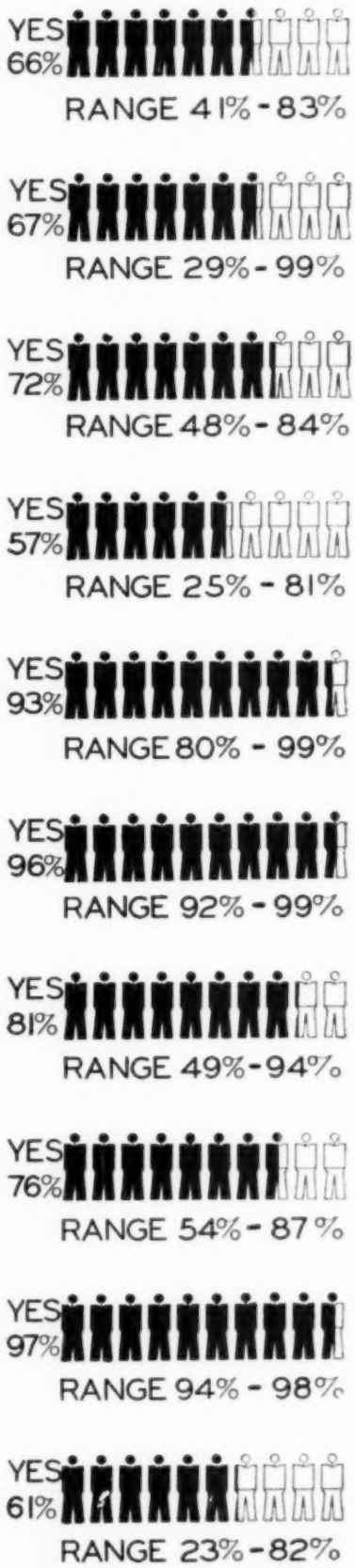
Percentages Tabulated

This tabulation shows the general trend of our findings, as indicated by the percentage of favorable answers to each question. The percentages shown are determined from the actual "positive" or "negative" answers to the specific questions indicated. The percentage shown under YES after each question is the average of all answers to that question for all Southern plants surveyed. The "Range" figures show the percent favorable answers for the lowest and highest plants respectively.

Those making use of the figures for comparative purposes should bear in mind that the figures shown are averages of answers from all types of industries surveyed, and may not be typical for any one industry. If we were to show averages for each type of industry, percentages in each category would differ appreciably from the general averages shown.

Yet, confidential studies within each industry do not show as much diversity as might be expected. For example, examination of results in two rather widely different industries (department stores and petroleum) both show averages that parallel the total general trend very closely. On the other hand, percentages from cotton textile mills and clothing plants differ rather widely, and both are at considerable variance with the total general industry averages given here.

Furthermore, interpretation of data such as this must be tempered by the time element. To get a large number of answers for averaging, it is necessary to use data accumulated over a number of years. Authorities in the personnel field realize that *certain* employee


Does this company pay as well as other companies for the same job?
YES 66%
RANGE 41% - 83%
Do you feel that pay for your job is fair compared with other jobs in the company?
YES 67%
RANGE 29% - 99%
Do you believe you can get as far in your company as you could in another company?
YES 72%
RANGE 48% - 84%
When a better job becomes vacant, does the best qualified person get the job?
YES 57%
RANGE 25% - 81%
Do you think the company will do all it can to give you steady work in the future?
YES 93%
RANGE 80% - 99%
Do you think you will be allowed to work here so long as you do your job well?
YES 96%
RANGE 92% - 99%
Do you think management is interested in the welfare of employees?
YES 81%
RANGE 49% - 94%
Do you think management keeps the employees in mind when making decisions?
YES 76%
RANGE 54% - 87%
Do you like to work with the people in your department?
YES 97%
RANGE 94% - 98%
Is your department free of troublemakers?
YES 61%
RANGE 23% - 82%

opinions tend to vary with general economic conditions. For example, in a period of depression when layoffs are necessary, variance in attitude on "company fairness" might be expected. But when all is well on the economic front, good feeling on the part of employees is likely to be at a peak.

Individual Studies Essential

From the above it will be clear that the data presented here can be valuable only as a guide in determining need for thorough individual analysis in each plant. No manager should become complacent merely because he feels his employee attitude is better than the averages we have indicated. And, conversely a plant with lower averages may not necessarily have poor standing with its employees.

Procedure Important

Like all survey work, the value of employee opinion studies depends largely on four elements of procedure.

1—Questions must be intelligently worded to get the needed information.

2—The questionnaires must be filled out under conditions which assure true freedom of speech in answering.

3—Results must be analyzed by trained interpreters who have ample experience to permit meaningful comparisons and recommendations.

4—A plan of action (follow-through) must be developed and carried out to correct those things which are hindering good relationships.

The tabulation shows our averages to date for a few questions we have used repeatedly in many Southern organizations during the past seven years. These averages will change over the years in proportion to the job Southern Management does in building and maintaining good personal relations. And the first logical step toward improvement is accurate evaluation of the present opinion of employees in the plant.

Do all of the employees in your department do their share of the work?	YES 53% RANGE 39%-84%
Can you carry a complaint to higher management without your supervisor holding it against you?	YES 65% RANGE 41%-77%
Do you know how you stand with your supervisor?	YES 48% RANGE 31%-73%
If you made a good suggestion would you get credit for it?	YES 67% RANGE 30%-93%
Does your supervisor tell you when you do your job well?	YES 61% RANGE 40%-83%
When changes are made in your work, are you told why?	YES 74% RANGE 46%-88%
When talking to your supervisor, do you feel free to say what is on your mind?	YES 78% RANGE 64%-86%
Do all employees in your department get equally good breaks?	YES 46% RANGE 21%-90%
If you make a mistake are you corrected in a friendly and helpful way?	YES 83% RANGE 42%-93%
Does your supervisor take time to discuss your problems with you?	YES 69% RANGE 52%-81%

Load conditions did not permit a loss of capacity . . .

CONDENSER CLEANING PROBLEM

Cooling System Acid Cleaned With Three Units in Operation

By I. ERNEST SHAFER and S. L. TERRY

Asst. Plant Mgr. Engineer

Southwestern Public Service Company, Amarillo, Texas

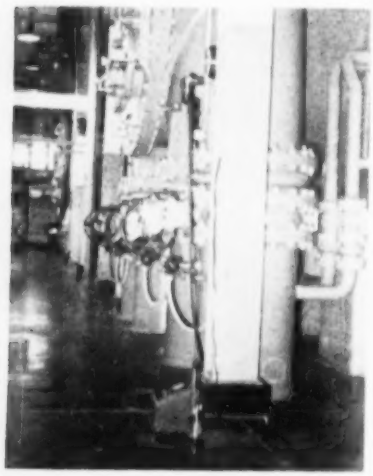
I. Ernest Shafer S. L. Terry

ERNEST SHAFER started his power plant career as diesel plant operator with Southwestern Public Service Company in 1941. During a three year tour of duty in the Army, Mr. Shafer completed several courses in electrical engineering and after his return to civilian life continued this study with I.C.S. His first experience in a steam power plant was in 1945 when he started to work in the station where he is now Assistant Plant Manager.

S. L. TERRY is a graduate chemist from West Texas State College. He was employed as Plant Chemist in 1942 by the Southwestern Public Service Company and has been with them since that time. His present duties include the supervision of water treatment in their eleven steam plants.

ONE OF the plants of Southwestern Public Service Company recently was faced with an unusual condenser scaling problem which was subsequently solved by acid cleaning the entire cooling system while the three units were in operation.

The cooling water at this plant is taken from a small lake formed by damming a river. The water is pumped through the condensers, over cooling towers and back to the lake. This unusual cycle is necessary as the lake does not have enough area to afford natural cooling for the 51,000 kw plant.



ACID FEED was controlled by this pH meter in place at condenser inlet.

Due to drouth conditions, flow has fallen, and there is not enough fresh water coming into the lake to keep calcium carbonate scale from forming as the water concentrates and is subjected to numerous warm-up, cool-down cycles before spilling over the dam. This carbonate scale has become a major problem, and a permanent installation is under construction to control its formation by pumping boiler flue gas into the cooling water at a point near the cooling water pump suction.

As the summer peak load developed and the drouth still hung on, the formation of scale was accelerated and the absolute back pressure built up to near three inches on two of the units. Acid cleaning by conventional methods requires a shut down and load conditions in our system would not permit the loss of capacity.

Corrective Measures

It is known that calcium carbonate scale will decompose in a cooling system when the pH of the water is below the pH of saturation of this material. This pH varies due to several factors and the speed of the reaction increases as the pH of the water is lowered. Previous experience had shown that a condenser could be cleaned of calcium carbonate scale by maintaining the circulating water pH at 7.0 for a period of two weeks.

In the case under consideration, however, there were factors which eliminated the possibility of a two weeks run. Obviously the pH of

the entire lake could not be lowered because of the quantity of acid which would be necessary. The valving arrangement in the system is such that the plant can be operating at reduced load on the cooling towers alone with the lake cut out of the systems but the river water cannot be concentrated above one and one-half cycles because of the high calcium and high sulfates. Higher concentrations would cause calcium sulfate scale to be deposited. Further complications developed due to the fact that well water for makeup to cooling towers was limited to 800 gpm and available only, from 10:00 PM until 6:00 AM on week nights and through Sunday.

Due to the severity of our problem it was decided to operate for five nights and the following Sunday on cooling towers only and use well water for makeup. Sulfuric acid would be used to hold the pH of the cooling water to the condenser at 4.0.

Cleaning Method

A tank trailer which holds 9,000 lb of 66° Baume Sulfuric Acid was spotted at the side of the cooling tower. A mixing trough was built so that the acid could be added into a strong flow of water and be thoroughly mixed before flowing into the tower basin.

Each night the plant load was reduced to a minimum, the cooling system valved off from the lake, and the well water makeup line opened into the cooling tower basin. Acid feed was regulated so that the pH of the water entering the condensers was 4.0. The system was continuously overflowed to maintain the calcium and sulfate concentrations below the solubility product of calcium sulfate at 110 F. These conditions were maintained for eight hours, each night for five nights and for an additional eight hours on Sunday. One week later, on Saturday night and Sunday a continuous run of 14 hours was made under the same conditions.

Scale Eliminated

The results of this acid cleaning procedure were very satisfactory. The terminal difference at the condensers was lowered to normal clean operation and the absolute back pressure was lowered to its normal reading of 1.5 in. of mercury. An inspection was made of a condenser to determine the effect of the low pH which had been maintained for a total of 62 hours. The tubes and tube sheets were clean and had the appearance of normal, slightly oxidized brass. No evidence of general or localized dezincification was present. The cast iron water box and the steel circulating water lines were clean of scale and showed no corrosion. A few bits of scale from the circulating lines were present in the tube ends at the condenser inlet but no serious stoppage of flow had occurred.

During the course of treatment the pressure drop through each condenser was watched very closely, since it was thought the heavier deposits of scale in the circulating lines might break away in large pieces and plug the condenser tubes. This, incidentally, is a very definite possibility which should be considered, but heavy scale deposits at such points are unusual.

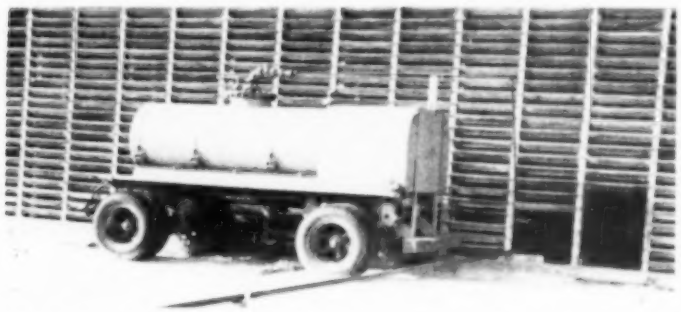
The entire course of treatment was carried on at 20,000 kw load and required 3,800,000 gallons of well water, 36,000 lb of 66° Baume Sulfuric Acid, and 88 hours of skilled operator's time. Total cost, $1,700.00, was only slightly more than the cost of acid cleaning one unit, assuming no charge for down time.

Comments on Method

Several interesting facts were discovered during the course of the treatment that had been speculated on prior to its start. The pH of the water entering the condenser was dropped to 4.0, and at the condenser discharge the pH was 4.5. Remembering that carbon dioxide is produced during the reaction of the acid on calcium carbonate and tends to hold the pH down, this is a surprising rise, and indicates rapid removal of scale. After leaving the condenser and being passed over the cooling tower, which was also scaled up, the water in the basin had a pH of 6.5. (Before dumping this water to the lake, the pH was allowed to rise to 7.0.)

This rapid solution of scale was followed by a sharp rise in calcium and sulfate in the system, which in turn required increased blowdown. Blowdown was regulated to maintain the calcium as calcium carbonate below 1200 ppm, since in this particular case, higher calcium concentrations combined with the sulfates present would have created the possibility of calcium sulfate scale.

The blowdown water from this process is the same type water as the river water. The acid is completely neutralized by action on the calcium carbonate scale and calcium sulfate is produced. The calcium sulfate concentration is only about 400 ppm higher in the blow-down water than in the river water, hence there is no waste disposal problem. The analysis of the lake water is not appreciably affected when normal operation is resumed.



SPOTTED NEAR MIXING TROUGH was this 9,000 lb capacity acid tank. Treatment required 3,800,000 gallons of well water and 36,000 lb of 66 F Baume sulfuric acid.

Worthington's new unit air conditioner fabricating plant in Alabama . .

Factory Construction Techniques

Worthington Corporation . . . Decatur, Alabama

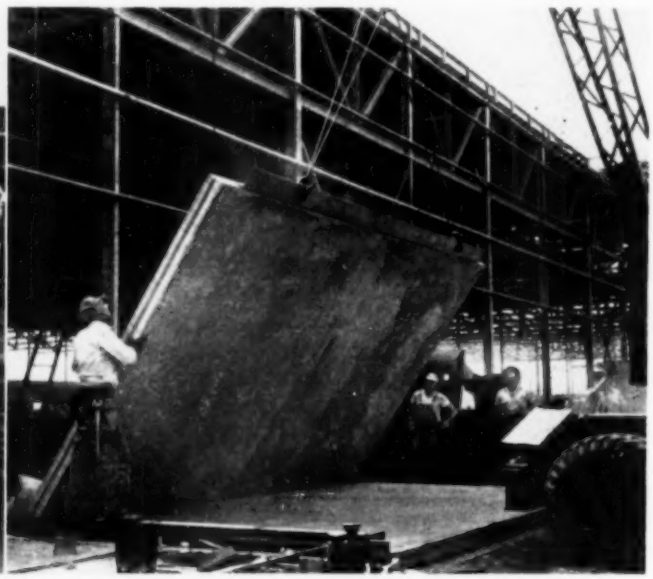
New materials and methods pay off in speed and value

Featuring: use of movable tilt-up concrete panels in curtain wall; giant fiber insulation panels; and six air conditioning platforms — raised into position in truss area with fans, coils, filters already in place.

PRODUCTION OF 3, 5, 10 and 15 ton packaged cooling units is scheduled for early 1954 in Worthington Corporation's 170,000 sq ft factory building in Decatur, Alabama. Use of new materials and techniques by The Austin Company, designers and builders of the plant, has paid off in speed as well as building value. In late November —only 123 working days after Austin started construction — the 640 x 240 ft production building was 95% complete.

Situated on a 135-acre tract that extends to the Tennessee River where future installation of docking facilities will provide Worthington with direct access to inland waterways, the plant has been designed for expansion to at least double its initial size. Movable tilt-up concrete panels in the 13 ft curtain wall on the river side were de-

SIX-INCH TILT-UP CONCRETE PANELS, used in the 640 ft removable curtain wall on the Tennessee River side of the plant were poured one on top of another in forms directly adjacent to the plant. Floor wax was applied to the top of each panel in the stack, before the next on top was poured.



PANELS WERE LIFTED DIRECTLY from the pouring position and lowered into place by a 12½ ton Link-Belt Speeder crane. The panels, each weighing approximately seven tons, were simply bolted to the columns for easy removal whenever it is necessary to expand the 170,000 sq ft fabricating plant.

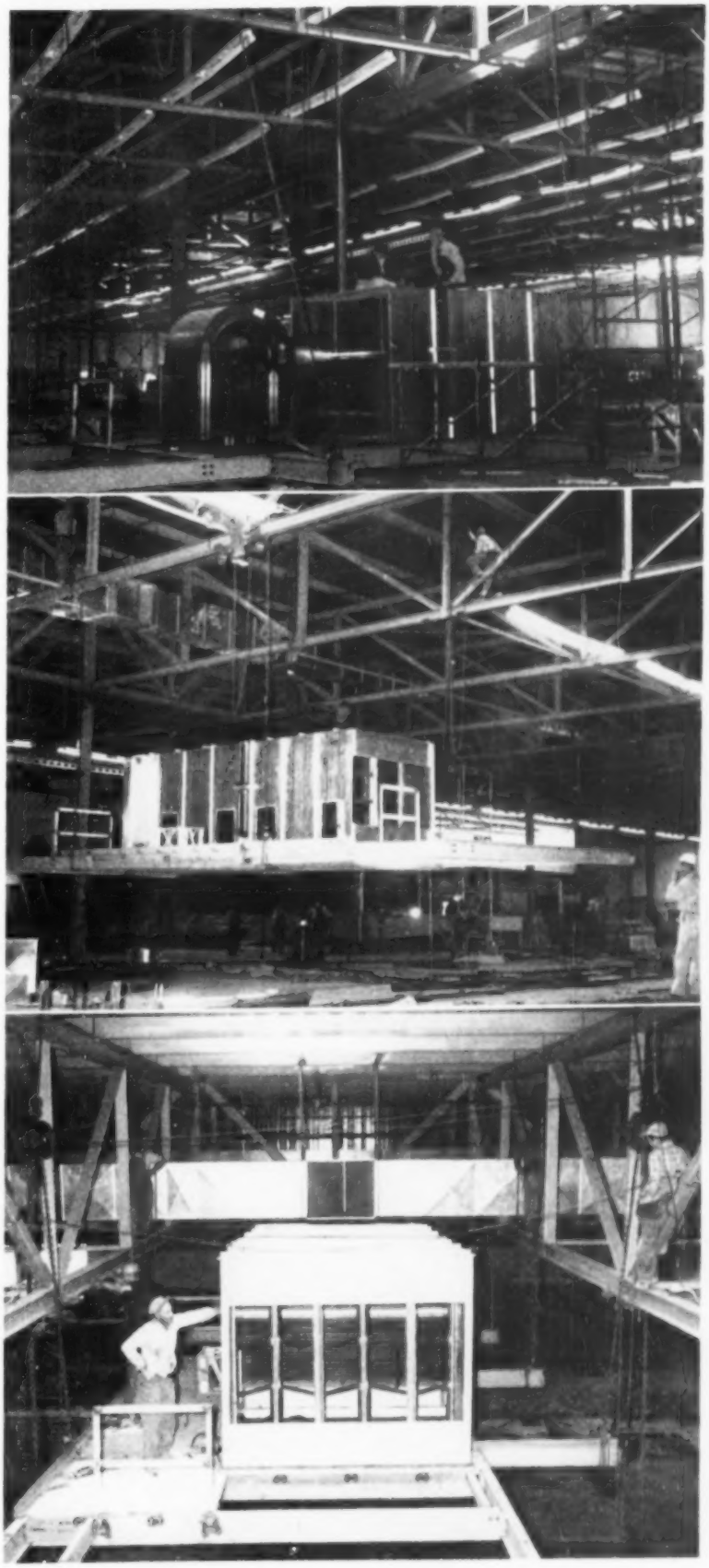
signed with a view to transfer and reuse in future walls whenever additional floor space is required.

Corrugated asbestos used to enclose the exterior above the masonry curtain walls has been backed up by 2 in. of Tectum fiber insulation in giant panels, 30 in. wide and up to 14 ft in length. These provide a clean-cut finished appearance throughout the interior and give the necessary thermal control and acoustical correction. Special formed metal clips, which are invisible and can be used entirely without tools, were employed to fasten the panels to the metal girts which are completely concealed by the insulation.

Six air conditioning platforms of Austin's special "integrated design" were raised into position in the truss area with fans, heating and cooling coils, and filters already in place. They are served by a 400 ton Worthington refrigerating compressor and two gas-fired package-type boilers in the small compact boiler room directly adjacent to the plant.

Overhead clearance of 24 ft has been provided throughout the interior of the plant, where the use

(Continued on page 72)



AIR-CONDITIONING PLATFORMS were assembled and fully equipped at floor level and then raised into position in the trusses. Photo at the top of the page shows a 20,000 cfm fan and some of the heating and cooling coils being installed.

INTEGRATED PLATFORM is on its way up into position in the 80 ft roof trusses where it will become an integral part of the structural frame. Each platform carries a 20,000 cfm fan unit, chilled water cooling coils, heating coils and filters. Note air distribution duct already in place in the trusses.

ONE OF THE SIX PLATFORMS is nearing installation point in the lower view. Chain hoists will be removed as soon as the job of bolting the platforms to the trusses is complete. Section of distribution duct is in the background, with an opening where the connection to the unit area platform will be made.

$20 million Louisiana expansion

by Commercial Solvents

Topping Units in Power Expansion

Commercial Solvents Corporation . . Sterlington, Louisiana

THE NEW power plant addition in the $20 million Commercial Solvents Corporation expansion at Sterlington, Louisiana, is a topping plant operating with the older 250 lb, 600 F plant.

Two new boilers deliver 600 lb, 735 F steam to two new automatic extraction turbo-generators only. The extraction is at 250 lb into the lower pressure system with the exhaust into the existing 40 lb system.

Boilers and turbine generators are sized so that the entire boiler capacity can be put through the turbine, including the extraction of any process steam needed beyond the flow through the low pressure unit. The extracted steam is at the same temperature, 600 F, as the lower pressure plant. There is no 600 lb-250 lb let-down or desuperheating station.

Extraction steam flow is held at a constant desired level by flow controllers. Boiler feed pump turbines are driven with 250 lb steam.

Controlled stack jets come on smoothly and supply sufficient draft for continued operation in case of power failure. There are no tie-ins with external power systems.

Louisiana Operation

The new Commercial Solvents Corporation facilities, costing in excess of $20 million, are additions to the company's existing ammonia and methanol plants. They will double CSC's production of these two basic chemicals.

New boilers and turbine generators (opposite page) are sized so that entire boiler capacity can be put through the turbine, including extraction of any process steam needed beyond the flow through the low pressure unit.

At the official opening of these plants late in October, 1953, J. A. Woods, president of Commercial Solvents, summarized the company's growth in Louisiana. The company first became active at Sterlington in 1931 when it acquired a majority interest in the Thermatomic Carbon Company. In 1942 Commercial Solvents built for the government an $11 million Dixie Ordnance Works. They operated it for the government until the end of World War II and purchased it in 1946.

In 1948 the first methanol plant was completed at a cost of over $5 million and with an annual capacity of 15 million gallons. Started in 1950, and completed in 1951, the first nitric acid units were added so that the company could furnish fertilizer manufacturers with nitrogen solutions.

In the fall of 1951, Commercial Solvents undertook the largest expansion program the company had ever undertaken at one time. This $20 million expansion makes the company one of the world's largest producers of methanol, with an annual output of 30 million gallons.

Ammonia produced in the new

(*Continued on page* 64)

NEW TURBINE GENERATORS (in foreground, top photo on opposite page) are 3000 kva, Worthington 600 lb, 735 F TT to 40 lb exhaust with automatic extraction at 250 lb, 3 phase, 60 cycle, 2400 volts.

NEW BOILERS are Riley Stoker, 120,000 lb/hr, 675 lb design pressure, 735 F TT, with air preheater.

SUPPLEMENTAL EQUIPMENT

Burners—Coppus Engineering

Boiler Feed Pumps—Worthington Corporation

Boiler Feed Pump Turbines—Worthington Corporation

Deaerating Heater—Cochrane Corporation

Forced Draft Fans—Buffalo Forge Co.

Induced Draft Fans—Buffalo Forge Co.

Meters and Combustion Control—Bailey Meter Co.

Filters—Elgin Softener Corp.

Softeners—Elgin Softener Corp.

Switchgear—Allis-Chalmers Mfg. Co.

PLANT PERSONNEL

J. E. Wheeler—Manager, Dixie Division

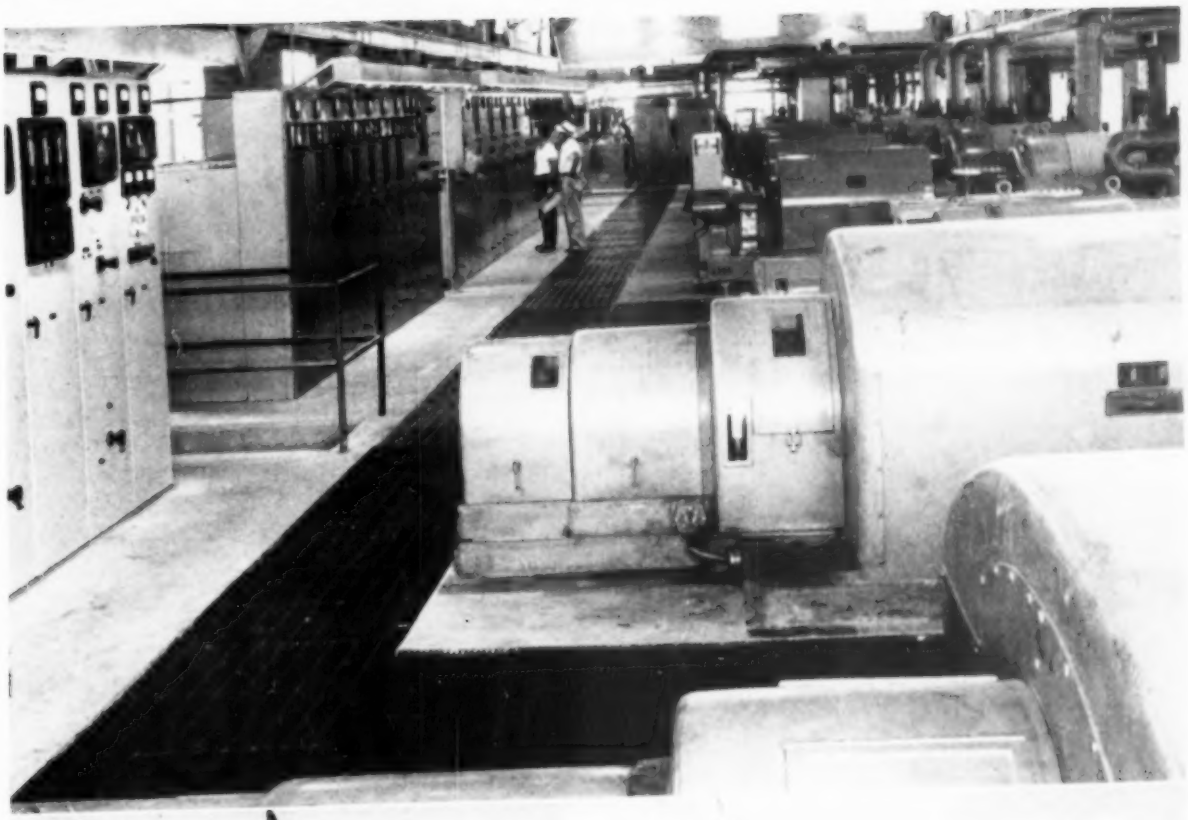
Olen Manhart—Plant Superintendent

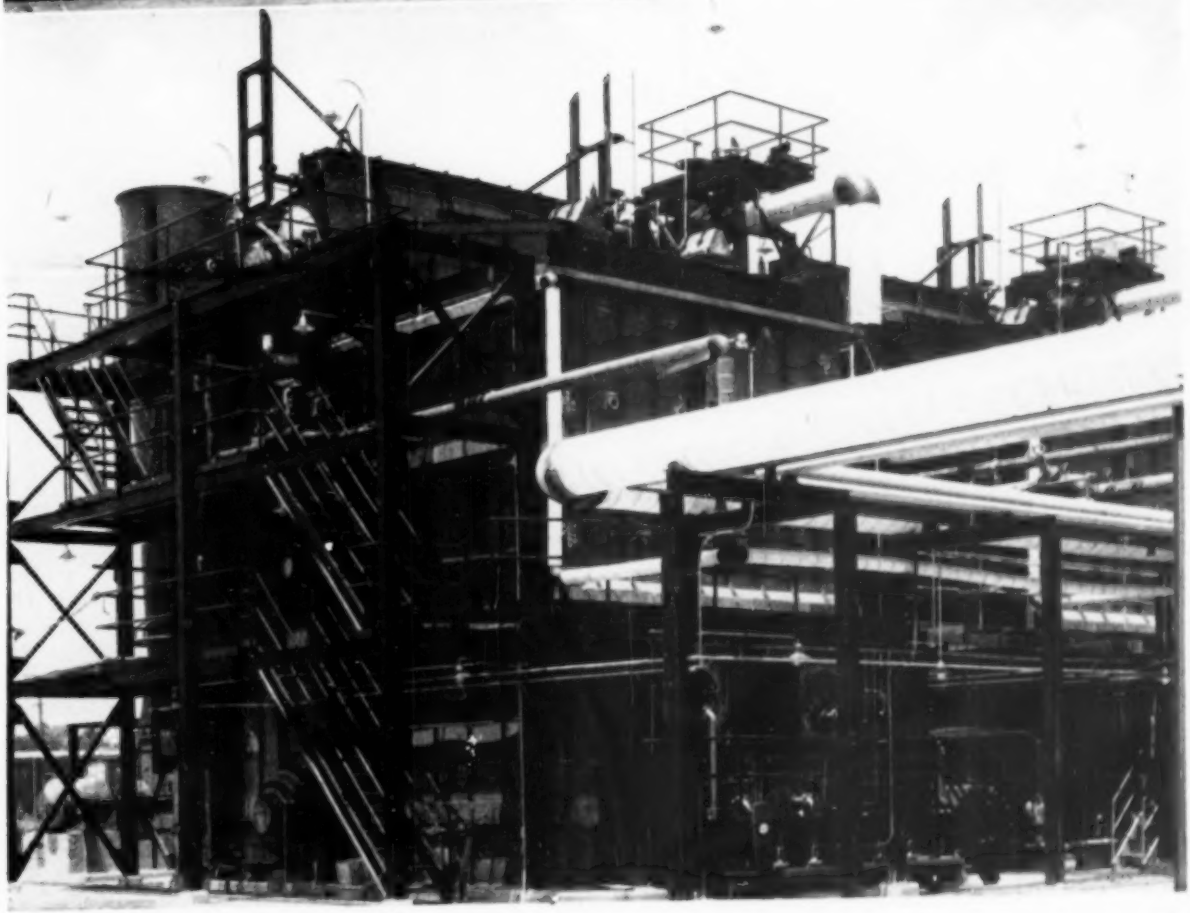
J. E. Sanchez—Plant Engineer

J. R. Troeltzsch—General Process Superintendent

L. R. McClain—Superintendent of Utilities Department

R. M. Ketteuring—Chief Electrician





With continuous process, maintenance on energized lines a necessity . .

Washing Them Down . . While Hot!

By W. R. THORSON, Electrical Superintendent

E. I. du Pont de Nemours & Company, Belle Works, Charleston, West Virginia

HIGH-PRESSURE washing operation under energized conditions on one of du Pont's substations at 44 kv.

ADOPTING a technique used by several large electric utilities, the Belle Plant of the E. I. du Pont de Nemours and Company near Charleston, West Virginia, maintains continuity of operations by washing cable terminals, bus supports, bushings, insulators, etc., on lines and substations up to 44 kv with a high-pressure water stream.

The usual danger of flash-overs that exists in any high voltage system is increased in chemical industrial plants. At our plant fog conditions are frequent due to the location of the plant near the Kanawha River and surrounding hills.

While much can be done toward preventing flash-overs by proper layout and equipment selection in the original design, it is not always possible nor economical to eliminate them entirely. It then becomes a problem in maintenance. In a plant such as this, which operates continuously 24 hours per day, seven days per week, the desirability of performing the necessary maintenance on energized lines is obvious.

The following are some of the important points in connection with the washing technique:

1. It is necessary to supply approximately 60 gpm of relatively

clean or filtered water at a pressure of 600 to 800 psi. Pressures of this magnitude are required to insure the desired scouring action and to decrease the hazard involved in the operation.

2. The nozzle should have a bore diameter of $\frac{1}{4}$" and should be suitable for the pressure used. A quick cut-off valve should be provided in the nozzle, enabling the operator to turn the water on and off readily. A nozzle of small diameter is required to build up the necessary discharge pressure, to reduce the amount of water required and to avoid splashing water upon adjacent equipment. The impact of a $\frac{1}{4}$" stream at 600 to 800 lb pressure is such that little more than a fog develops more than a few inches from the target, and solid masses of water do not splash over on adjacent insulators. The small stream of water also makes it possible to wash only a small portion of a large bushing or a long string of insulators without wetting the entire unit.

The nozzle should be grounded by means of a bare flexible copper conductor brazed to the nozzle and carried along the outside of the hose to a structural member or artificial ground, such as a ground rod or plate that is known from recent tests to measure less than five ohms. The pump and truck should also be grounded and one man be made responsible for all ground connections. Rubber gloves should be worn while washing energized lines of any voltage.

3. Washing should be done with the nozzle below and to one side of the insulator. Best results are obtained when nozzle is in such a position that it makes approximately a 45° angle with the horizontal.

4. Cross arms and structural members above insulators should be washed thoroughly. Flash-overs are often precipitated by rain water trickling over structural members becoming contaminated with chemicals and then running or dripping down on insulators.

5. A special rubber hose suitable for water pressures up to 800 psi is available and should be used. The internal diameter of the hose should not be less than $\frac{3}{4}$".

6. In washing lines up to and including 44 kv, the nozzle should be 15 ft from the target. In washing lines at voltages above 44 kv up to and including 132 kv, the nozzle should be 20 ft from the target. Reliable tests indicate that washing could be safely done at somewhat shorter distances, but these distances are recommended as sufficient to insure against serious consequences if the nozzle should become ungrounded, and to provide for mistakes in judgment of distances, variation in conductivity of water and variation in pressure developed by the pumping equipment.

7. A string of moderately dirty insulators can be washed in less than one minute.

In washing insulators on lines above 11 kv, considerable noise and visible sparks may develop as the water first strikes the insulator. When this happens, the water should be instantly directed at the fire, and washing of the insulator continued until the condition clears up or a flash-over occurs. If the stream is directed away from the insulator as the sparks appear, a flash-over will almost certainly occur and consequently nothing is to be gained by doing so.

Equipment necessary for washing insulators will vary according to the requirements of a particular location. At du Pont's Belle Plant, the high-pressure pump, an electric motor to drive it and auxiliary equipment are mounted on a four-wheel trailer (see photo). The water supply is taken from a filtered water line through a hose connection. However, a 250 gallon tank is placed on the trailer for use when a suitable water supply is not available. Several 440 power supply outlets are placed at convenient locations near the various substations and transformer installations. It would be more convenient to use a gasoline-driven pump if line insulators are to be cleaned.

The washing schedule at the Belle Plant varies with the weather conditions. A rain following a long dry period when insulators are covered with dust and chemicals will invariably cause a flash-over to ground. This condition is avoided by washing periodically during dry weather.

We believe this method of cleaning high voltage insulators and bushings has prevented numerous shutdowns at this plant during the past eight years and we plan to continue this practice until better methods can be developed.

REFERENCES

"Insulators Washed on Energized 132 kv Line," by M. V. Eardley, *Electrical World*—April 15, 1944.

"Live 220 kv Line Insulators Washed to Stop Leakage," by F. G. Mueller and L. V. Schofield, *Electrical World*—August 5, 1944.

Protective Coating For Texas Plant

BREWING malt is shielded against air and moisture by a coating based on Vinylite resins sprayed on four new silos at The Lone Star Brewing Company, San Antonio, Texas. The coating was used to extend the life of the silo masonry and reduce the cost of maintaining it, as well as to preserve the quality of the brewing material.

Based on Vinylite resins, Secoton Elastic Vinyl Membrane Coatings are supplied by Surface Engineering Co., Inc., Wichita 1, Kans.

Carolina plant engineers discuss troubles and remedies . .

Electrical Conference

SP&I report features: motor lubrication . . control enclosures . . grounded vs. ungrounded power systems . . high interrupting capacity fuses . . and N.E.M.A. motor rerating program.

ABOUT 250 plant engineers and maintenance men from textile mills in the Piedmont-Carolinas gathered in Raleigh, N. C., October 29 and 30th, for a Conference on Electrical Equipment. Conference was jointly sponsored by the Textile Sub-Committee and North Carolina Section of the American Institute of Electrical Engineers, and the Schools of Engineering and Textiles of North Carolina State College.

THIS REPORT by George Dockray, SP&I's Field Editor in the Carolinas, features abstracts of several papers and a brief resume of the panel discussion on "Electrical Problems and Remedies."

Panel Discussion at the Carolina Meeting

Motor Lubrication—The principal topic discussed was the lubrication of small motors. A representative of a large manufacturer of synthetic fibers stressed that, in his experience, a regular schedule for oiling motors is essential, despite the fact that an experienced oiler is more valuable than any schedule. The schedule must be flexible, and revised as experience dictates.

At this plant, a regular oiling crew has done all oiling of motors during the past four years, except for those in the power house, which are oiled by electricians.

One panel member was of the opinion that oiling schedules for motors are given too much emphasis. Bearing failures traceable to lubrication faults are rare; most occur through other causes. There are more failures from over-greasing, rather than under-greasing. He cited a recent case of a spinning frame motor which ran for about 15 years with no lubrication at all.

The same panel member commented on the growing use of permanently sealed bearings in small motors, both here and abroad. One European company (Siemens-Schuckert) permanently packs all motors up to 50 hp; no provision is made for oiling.

Control Enclosures—The development and standardization of industrial control equipment enclosures suitable for textile mills was reported on by Swaffield O. Cowan, Factory Insurance Association. The problem has been under study by a joint committee of the A.I.E.E. and the National Electrical Manufacturers Association since early in 1952.

The committee recommends that control enclosures meet the following requirements:

1. Prevent entry of lint and escape of sparks.
2. Have no unused openings.
3. Have no conduit knockouts or conduit openings. Suggested conduit entry locations to be suitably indicated on the enclosure.
4. Provide sufficient room on each side of the mechanism to accommodate wires sized for maximum current rating.
5. Cover latching device to be positive and reliable.

Enclosures meeting these requirements are already available, designed to operate in an atmosphere of explosive dust; but the flash fire hazards in a textile mill,

although serious, do not justify their weight, bulk, and prohibitive cost.

The industry is rapidly abandoning the use of the N.E.M.A. Type I general purpose enclosure, which is not dust-proof, in favor of a modification with a cover gasket. While this enclosure is not entirely satisfactory, it is a big forward step.

Although there is no control enclosure available which meets the committee's specifications, at a reasonable cost, continuing work is expected to have early results.

Grounded vs. Ungrounded Power Systems

Abstract of comments by
H. C. SWANNELL
J. E. Sirrine Co.

Ungrounded systems—The ungrounded-neutral system for distribution of power in textile mills (majority use a distribution system of 400 volts or less), has been universally used for years.

Although the possibility of ground faults has increased greatly, it appears that actually ground faults do not occur too frequently. This is confirmed by a survey of three large plants, where 25,000 or more motors, as many control devices, and miles of low-voltage circuits are in use. In only one case are ground faults as frequent as once a day; the other two mill groups report one or two a week.

The most important single factor contributing to ground faults is building and machine vibration. For these plants, grounding the neutral of the power distribution system would not alter the conditions that produce ground faults.

When a ground fault occurs with a grounded-neutral system, production must be interrupted until repairs are made. With an ungrounded system production can be continued while the fault is found and repaired during a normal shut down period.

One of the principal reasons cited for grounding the neutral of low-voltage systems is to reduce transient over-voltages induced by intermittent ground faults. However, on 600 volt systems the transient over-voltage due to ground faults does not exceed the motor test voltage, and for 480 and 250 volt systems is less than the test voltage.

The only practical method of providing a grounded-neutral system for a majority of mills is to use a grounding transformer, which, apart from increased cost, has limitations which may prevent any substantial reduction of ground faults.

In summary, textile mill experience over many years of operation with ungrounded-neutral systems has been generally satisfactory. At best, any gain achieved through changing to a grounded-neutral system would be limited, and would usually involve considerable expense.

Abstract of comments by
H. B. GREEAR
General Electric Co.

Grounded power systems—The practice of grounding the neutral of transmission and distribution systems has been followed for years by the electric utility companies, and during the past 10 years has been adopted by many industrial plants.

Grounding the neutral of distribution circuits at 600 volts or less was not initiated on any scale until it was introduced in new plants built during World War II. Since few of these were textile mills, grounded-neutral operation on low-voltage systems has been mainly in other types of plants.

One of the principal reasons for using the grounded-neutral system is to reduce the number of failures from over-voltages in motors and other equipment. These overvoltages result from lightning, intermittent grounds on ungrounded-neutral systems, or from resonance effects.

All ungrounded-neutral power distribution systems, such as those in a textile mill, may be thought of as capacitors, hence, when a ground occurs, repetitive restrikes of the arc across the point of ground permit voltages of five or six times normal to build up. Although these voltages may not be more than the *one minute* high potential tests on new equipment, moisture and other factors reduce the actual amount of overvoltage the equipment will withstand after it is in service for some time.

With a grounded-neutral system, there is no tendency to restrike the arc at the point of ground, since the power current does not lead its voltage in the same manner as the capacitor current. Therefore, overvoltages are not obtained, or are so small that they are not objectionable.

Where purchased power is involved, the majority of the main power transformers are of considerable size and are delta-connected on the 600 volt side. In these cases the cost of securing

PANEL DISCUSSION on "Electrical Problems and Remedies" was one of the meeting highlights.

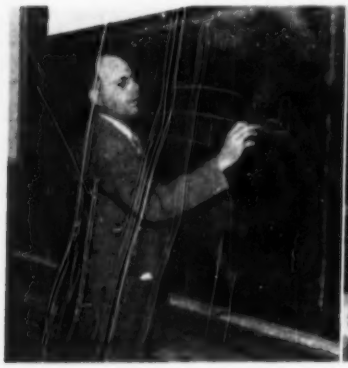
Panel was composed of (left to right) **W. W. Hanks**, Southern Electric Service Co., Charlotte, N. C.; **M. R. Brice**, Cutler-Hammer Inc., Milwaukee, Wis.; **J. C. LeBens**, Bussman Mfg. Co., St. Louis, Mo.; **C. C. Gould**, Square D Co., Milwaukee, Wis.; **G. A. Bumann**, Century Electric Co., St. Louis, Mo.; and **W. H. Formhals**, Westinghous Electric Corp., Buffalo, N. Y. **J. D. McConnell** (standing, rear) Cone Mills Corp., Greensboro, N. C., was moderator.

the grounded-neutral system is the price of a grounding transformer, plus the cost of equipping feeder breakers with a third trip coil, if they do not already have three coils.

On new unit substations the transformers can be secured with the secondary wye connected at little or no extra cost; therefore for new installations the extra cost of securing the grounded-neutral system is negligible.

The advantages of the grounded-neutral system are:

1. Fewer failures of motors and other equipment.
2. Less time required to find grounds.
3. Less interruption to production.
4. Less danger to personnel.



Dan McConnell, Cone Mills Corp., Greensboro, N. C., illustrates a point during the panel discussion.

Reduction in size of standard motors was explained by W. H. Formhals, Westinghouse Electric Corp.

The N.E.M.A. Motor Rerating Program

Abstract of comments by
W. H. FORMHALS
Westinghouse Electric Corp.

THE Motor and Generator Section of the National Electrical Manufacturers Association is engaged in establishing standards in the public interest, and for general use by the electric motor industry. These standards define operating characteristics and dimensions to assist users in the proper selection of motors and generators.

In the past 25 years there has been no change in frame assignments for the most popular, high production ratings from 1 to 15 hp, except for one minor change in 1940. In this period our technological advances have been such that motors are being built in much larger frame sizes than is necessary.

On November 12, 1952, the N.E.M.A. approved a suggested standard for design of alternating current open-type motors from 1 to 30 hp. Since that time additional standards, including those for enclosed motors and open motors of other speeds have been recommended and approved. The standards are, of course, entirely voluntary.

N.E.M.A. Numbering System. The N.E.M.A. system of numbering the frames of integral horsepower motors is as follows:

1. The first two digits of the frame number are equal to four times the dimension from the motor base to the shaft center, in inches. Thus, a 180 diameter motor must have a shaft center height from the motor base (known as the "D" dimension) equal to 18 divided by 4, or 4½ inches.

2. The third digit of the frame number pertains to the distance from the frame center line to the center of the bolt holes in the feet of the motor, measured laterally, and is obtained from an approved preferred numbering system chart. Thus, a 182 frame motor must measure 2¼ in. at this point. This is known as the "F" dimension.

The smallest diameter of motor made according to the new standards will be available about January 1, 1954, to be followed at about 5-month intervals by the larger frames. Individual availability dates of all rerated motors will be determined and announced by each motor manufacturer.

High Interrupting Capacity Fuses

Abstract of comments by
J. C. LEBENS
Bussman Mfg. Co.

AS industrial processes become more automatic, electrical system capacities are increased and continuity of electrical service becomes more important. To protect such systems requires the use of electrical fuses with special characteristics.

Under normal operating conditions, electrical current can vary within extremely wide limits without injuring equipment as long as the current is not permitted to flow longer than a predetermined, safe time. If the current is cut off too soon, unnecessary interruptions reduce efficiency of production. On the other hand, if the current is allowed to continue for too long at over-load, the machine is damaged.

Power fuses rated at 600 volts or less, commonly referred to as low voltage fuses, are commercially available in three basic types: nonrenewable, renewable, and dual-element fuses.

The nonrenewable is the oldest and most common type of low voltage cartridge fuse. It consists of a zinc link surrounded by an arc-quenching filler. This type of fuse has very little time-lag, so that on motor circuits, its capacity must be several times the ampere rating of the motor it is to pro-

In any typical power plant installation, the *difference in cost* between the best possible combustion control system and a "second best" system is less than the cost of the fuel burned in one week.

The *difference in performance*, though it may be as little as ½ of 1% of fuel consumption, means a fuel saving *every year of operation* of two to four times as much as the difference in cost.

Here is how it works out in three typical power plants, assuming 6,000 hours of operation per year and a life of 20 years—which is considerably less than the useful life of the average boiler—and using current average fuel prices, which are not likely to decrease within the foreseeable future.

CASE No. 1

Plant Cost	$1,600,000
Boiler Capacity—100,000 lb/hr steam	
Estimated cost of simplified control system	25,000
Estimated cost of best possible control system	30,000
Fuel cost over a 20-year period, minimum	4,800,000
Fuel cost over a 20-year period, maximum—not less than	6,000,000

Saving on fuel by using best possible control, estimated at ½ of 1% — from $24,000 to $30,000.

IN COMBUSTION CONTROL SYSTEMS

anything less than the best is too expensive-

Plant Cost	$ 8,250,000
Boiler Capacity—500,000 lb/hr steam	
Estimated cost of simplified control system	45,000
Estimated cost of best possible control system	65,000
Fuel cost over a 20-year period, minimum	24,000,000
Fuel cost over a 20-year period, maximum—not less than	30,000,000

Saving on fuel by using best possible control, estimated at ½ of 1% — from $120,000 to $150,000.

CASE No. 2

Plant Cost	$ 42,000,000
Boiler Capacity—2,500,000 lb/hr steam	
Estimated cost of simplified control system	55,000
Estimated cost of best possible control system	90,000
Fuel cost over a 20-year period, minimum	120,000,000
Fuel cost over a 20-year period, maximum —not less than	150,000,000

Saving on fuel by using best possible control, estimated at ½ of 1% — from $600,000 to $750,000.

CASE No. 3

The thousands of Hagan Combustion Control Systems, installed in plants of all types and sizes, in all parts of the country, are your assurance that Hagan Control in your plant means maximum efficiency with the minimum maintenance throughout the life of the boiler. Our engineers will be glad to provide full information. Hagan Corporation, Hagan Building, Pittsburgh 30, Pennsylvania.

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RING BALANCE FLOW AND PRESSURE INSTRUMENTS
METALLURGICAL FURNACE CONTROL SYSTEMS
CONTROL SYSTEMS FOR AUTOMOTIVE AND
AERONAUTICAL TESTING LABORATORIES

tect, to eliminate needless blowing on harmless overloads. Hence, there is a range between the full load capacity of the motor and the rating of the fuse in which the motor can be damaged without the fuse blowing. For this reason the principal function of the nonrenewable fuse is to isolate faults and protect against short-circuit currents.

The renewable fuse reduces fuse replacement costs, and can be built with a time-lag so that its rating can more nearly approach the rating of the circuit without needless blow-outs.

The time-lag is obtained by reduced sections or weak spots in the fuse link. At low overloads, these weak spots transfer heat to adjacent zinc lag plates, but at high overloads there is no time for thermal conduction and the fuse blows rapidly.

The dual-element fuse combines a thermal cutout with a fast-acting fuse link. The time-lag possible with dual-element fuses makes it practical to match the time-current characteristic of the fuse to the safe time-current characteristics of the system, so that unnecessary circuit interruptions are eliminated.

The electrical loads in modern industrial plants require large-capacity circuits capable of delivering heavy short-circuit currents under fault conditions. The protective device must clear these short-circuits without creating a hazard. Fuses with sufficient interrupting capacity must be used on such circuits.

Tests conducted on the Fusetron dual-element fuses show that these fuses have interrupting capacity in excess of 100,000 amperes, and that the fuse clears the short-circuit so rapidly that the actual current flowing is held to safe, nominal values.

To complete the protection picture, Hi-Cap fuses which coordinate with the dual-element fuse are now available in sizes from 1,000 to 5,000 amperes. These fuses also have an interrupting capacity in excess of 100,000 amperes.

By using the Hi-Cap fuse in conjunction with the Fusetron dual-element fuse it is now possible to design a completely coordinated protection system from the smallest branch circuit fuse to the main fuse with adequate interrupting capacity.

Gas Conversion in North Carolina

(*Starts on page* 46)

benefit is that it is possible for the plant to use any reasonable volume of gas during any 24-hour period.

While it is possible to burn coal and gas simultaneously, it is doubtful that such an arrangement will ever be necessary. However, in testing the equipment and training mill personnel, these conditions were actually established and worked very satisfactorily. During the test, fuels were switched without any interruption of boiler operation, and in fact without any loss of steam pressure.

Regulation on Metering

Gas pressure is reduced from an initial line pressure of 440 psi to 200 psi by means of controller-operated regulators at the takeoff station. It is then transmitted through 3,000 ft of 6″ line to the regulation and measuring station at the mill, where the pressure is further reduced to 75 psi. At this pressure, the gas passes through two 8″ meter runs equipped with Robinson full orifice fittings, and is measured by two 100″ differential range double integrating orifice meters. By using a differential valve on the first meter run, which operates a motor valve in the secondary run, we are able to maintain accurate measurement throughout a flow range of 60,000 to 500,000 cu ft per hr.

When the differential in the first run reaches 90″, the differential valve opens the secondary run, which remains in service until the load falls off and causes the differential to drop to 10″. The secondary run is then automatically closed until the load increases enough to open it again.

Under normal operating conditions, both meter runs are in operation; but when the load is curtailed, or over the week-end, the primary run is sufficient to handle it. After measurement, the gas pressure is reduced again from 75 psi to 25 psi, which is served directly to the mill.

Topping Units in Louisiana

(*Starts on page* 56)

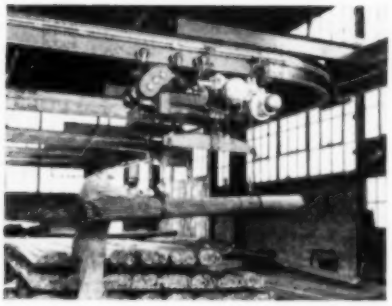
unit will be processed into approximately 75,000 tons of ammonium nitrate fertilizer and 30,000 tons of nitrogen solutions—both for use in crop fertilization. The new facilities enable Commercial Solvents to produce nitrogen in its three most useful forms: anhydrous ammonia and solid nitrate for direct application, and solutions for mixed fertilizers.

An unusual new process which eliminates many of the expensive facilities and process steps hitherto required is being used for the first time in making ammonium nitrate fertilizer. It is housed in separate buildings three miles from the Sterlington plant. The new method eliminates the conventional prilling towers, coolers and driers.

Engineering

Ford, Bacon and Davis Construction Company was the prime contractor who constructed the facilities. The Chemical Construction Corporation of New York did the process design and engineering of the gas preparation unit and the Chemical & Industrial Corporation of Cincinnati built the nitric acid plants. The ammonium nitrate plant was engineered by Commercial Solvents' engineering division. In fact, with the exception of the gas purification design, the company's engineering division designed and planned these plants.

MONORAIL *Pays!*



INCREASES TONNAGE

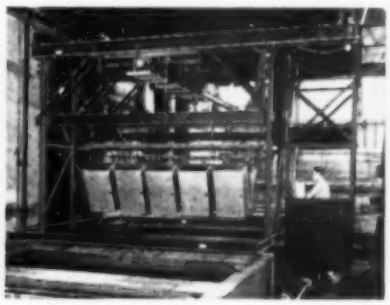
From 26 to 48 tons of steel rod per day was the increased movement produced by a properly engineered monorail system.

LOWERS COST

This simple system actually saved $150 in handling costs within four months of operation. No more sheet-by-sheet movement.

SAVES TIME

Passage, on monorail, of metal parts through infra-red dryer, cuts 70% from former drying time. All other handling in plant on monorail.



MORE CAPACITY

30% more capacity was added to metal cleaning process by handling a third more units on carrier with one man operation from cab control.

LESS LABOR

Operators claim to save 26 man hours per truck over former unloading time. Interlocking monorail cranes in the plant also reduce handling costs.

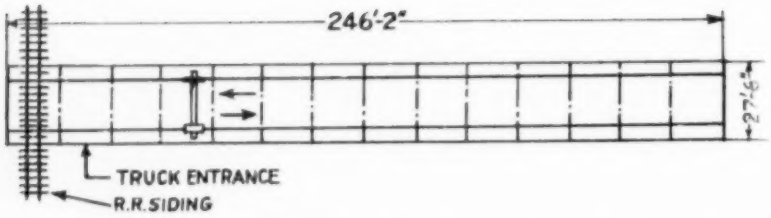
Write for Bulletin C-1
showing many more cases where MONORAIL PAYS!

THE AMERICAN MONORAIL COMPANY

13105 ATHENS AVENUE **CLEVELAND 7, OHIO**

Virginia warehouse saves $30 on every car unloaded

Crane Speeds Pipe Handling



SYSTEM FEATURES an American MonoTractor Crane, Robbins and Myers hoist and an American MonoTractor drive.

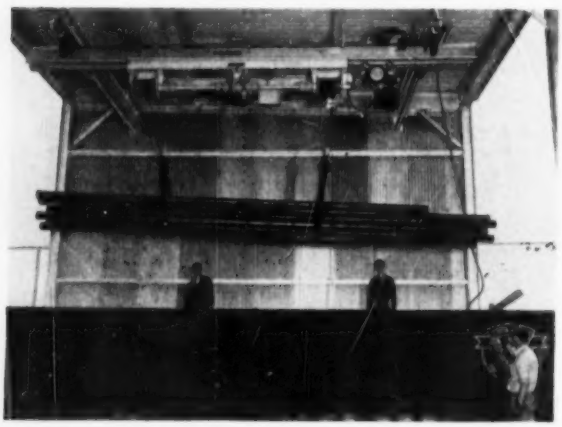
EVERY time a carload of pipe averaging 60,000 lb is unloaded in its Roanoke warehouse, The Noland Company, Inc., jobbers of plumbing, heating and industrial supplies throughout the Southeastern States, realizes a saving of $30 per car.

Pipe, of various sizes, is unloaded from gondolas as follows: Two men in the car attach the flat slings on the twin-hook electric hoists to a load of pipe. By push-button control the crane operator raises the load to the upper limit and then dispatches the power propelled crane to any of 13 stations over the 246 ft craneway where it contacts a retractable limit switch and stops.

At this point, a man on the warehouse floor takes over control, places pipe in the proper rack, unhooks one side of each sling and pulls the sling through the pipe by raising the hoist hooks. He then dispatches the crane back to the car for another load.

This system includes an American MonoTractor Crane of 2-ton capacity operating at 250 fpm on Girder Rail Craneways. The carrier unit consists of a Robbins and Myers twin-hook 2-ton standard speed hoist connected with an American MonoTractor drive at 75 fpm for traverse travel on the crane bridge.

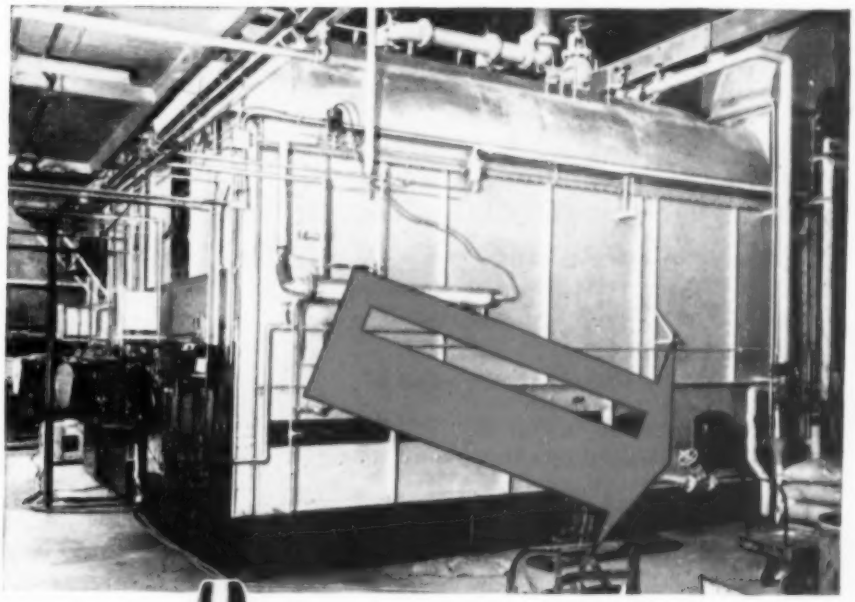
It is estimated that this system will pay for itself by the savings mentioned above in less than a year.

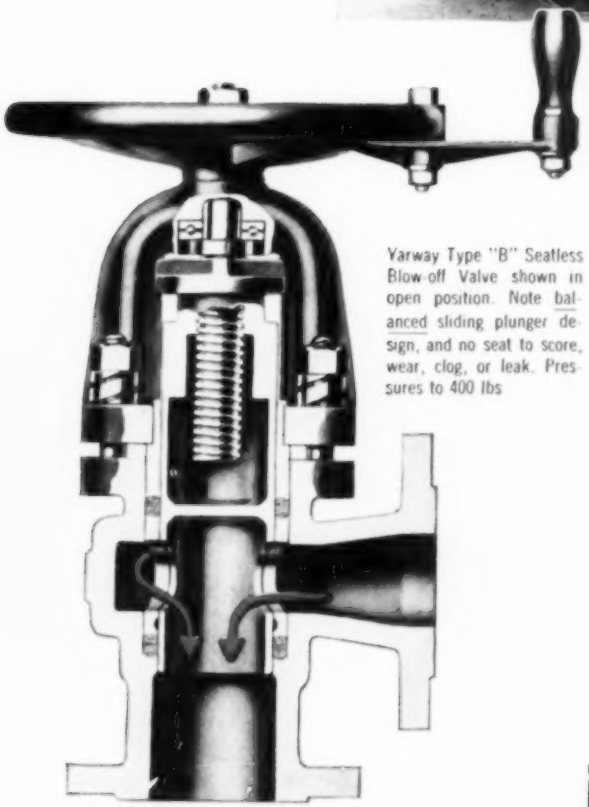


TWO MEN load pipe in slings. Crane operator raises load to upper limit and dispatches crane to one of 13 stations in warehouse.

LOAD IS THEN LOWERED in rack, one side of flat slings removed, hoist raises slings and crane is then returned to the railroad car.

THIS ERIE CITY "PACKAGE" INCLUDES A YARWAY SEATLESS





Yarway Type "B" Seatless Blow-off Valve shown in open position. Note balanced sliding plunger design, and no seat to score, wear, clog, or leak. Pressures to 400 lbs

■ The above installation of two 300 hp. Erie City VL type boilers at a Detroit automotive plant shows Yarway Seatless Blow-off Valves as part of the "package" picture.

Good package-type boilers are *better* when equipped with Yarway Blow-off Valves.

Get the advantages that have made Yarway Blow-off Valves guardians of blow-down lines in more than 15,000 boiler plants. On your package boilers—whatever the make—high grade blow-off valves pay off in dependable, trouble-free service.

Write for Yarway Bulletin B-426.

YARNALL-WARING COMPANY

Home Office: 116 Mermaid Ave., Philadelphia 18, Pa.
Southern Representative:
ROGER A. MARTIN, Bona Allen Building, Atlanta 3, Ga.

YARWAY

SEATLESS

BLOW-OFF VALVES

Waste problem solved . .

Industrial Waste Disposal Plant at Bell Aircraft Corporation—Texas

By HOWARD PECKHAM and RICHARD SPRINGER

Chief Chemist and Assistant Chemist, Bell Aircraft Corporation, Fort Worth, Texas

Nearly all industries need to dispose of some type of plant waste. Here's how Bell Aircraft treats chromate, cyanide and acid alkali waste

IN Bell Aircraft fabricating operations, metal parts—both ferrous and non-ferrous—are given special treatments to improve their corrosion resistance. Many aluminum alloy parts are cleaned, anodized and painted; steel parts are usually sandblasted or pickled and either cadmium or chrome plated. Several types of dilutes and concentrated wastes result from these cleaning and plating operations.

The plating wastes are segregated by curbing in the Plating Department into the following types:

1. Wastes containing hexavalent chromium
2. Wastes containing cyanides and traces of toxic metallic ions
3. Acid or alkali wastes which contain neither cyanides, chromates, nor toxic metallic ions.

The wastes flow through individual drain lines by gravity to their respective holding tanks at the waste unit. When a tank is filled the waste stream is diverted to a companion tank and treatment is begun.

The wastes received at the unit may be either dilute or concentrated. Dilute wastes are those which are rinsings from plated parts. These wastes contain small concentrations of the toxic materials since in most plating procedures, each operation is followed by two rinses in flowing tanks. The average concentrations of the toxic materials in these wastes are as follows:

Waste	*Material*
Chromate Wastes (as Cr)	20–70 ppm
Cyanide Wastes (as CN)	5–10 ppm
Acidity (as H_2SO_4)	1500–2000 ppm

Concentrated wastes are generally those which result from dumping of spent solutions from plating tanks. These wastes contain from 2% to 30% by weight of toxic materials. Since a new charge in most tanks will last from 3 to 6 months, it is not often that concentrated wastes are encountered. A source of concentrated cyanide waste is from the Perliton 11 salts used in heat treating steels. These salts

Bell Aircraft Corporation's Texas Operation

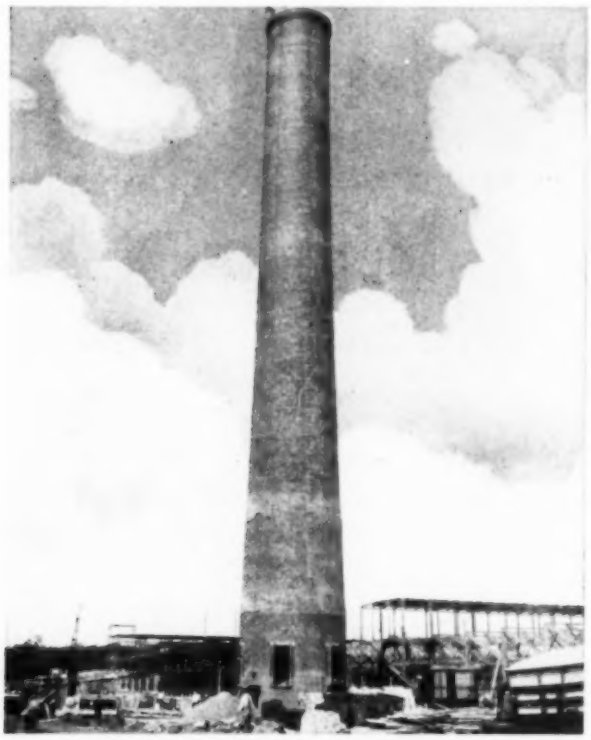
AT Hurst, near Fort Worth, Texas, Bell Aircraft Corporation's Helicopter Division boasts the first plant designed and built exclusively for the manufacture of helicopters and is currently turning out more rotary-wing aircraft than any other manufacturer.

The company's initial venture into helicopter production came in 1942, when the first of the famous Model 47 series was built and tested in an abandoned garage on the outskirts of Buffalo. Since then, more than one thousand have rolled off the assembly line and have been delivered to both commercial and military operators in the United States and 27 foreign countries. They have been put to a wide variety of uses, including crop dusting and spraying, airmail delivery, geological survey, and rescue and evacuation.

Early in 1951, Bell moved its Helicopter Division to temporary quarters in Texas, and in January of 1952, first production work in the present modern facility began.

In addition to the Model 47, the company has produced an 8-to-10 place H-12 for the Army and the XH-15 high altitude machine for the Air Force. Assembly line production of the Navy's big tandem-rotor anti-submarine HSL is now under way.

SELECTING THE RIGHT CHIMNEY
is Important Costwise



Erected by International Chimney Corporation for American Enka Corporation, Enka, Tennessee. 200' x 15'6"

● Pictured at the left is an excellent example of the right chimney for a tough job. It was designed by International Chimney Corporation to specifically handle the diffusion of acid fumes that generate from rayon processes. The uninterrupted service, free from maintenance, given by this chimney has far exceeded the performance from regularly-designed rayon-fume chimneys — a real pay-off for its owners.

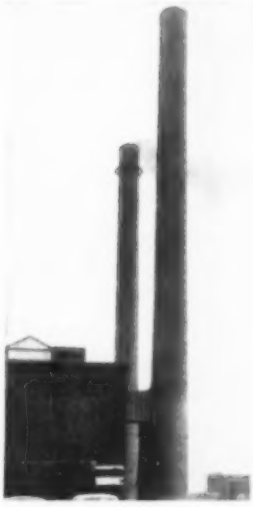
International Chimney Corporation engineers design and construct radial brick, reinforced concrete and self-supported steel chimneys for:

- **Boiler Plant Operation**
- **Incinerator Waste Disposal**
- **High Temperature Gas Diffusion**
- **Low Temperature Acid Fume Dispersion**
- **Alkaline Process Waste Gas Dissipation**

GOOD CHIMNEY MAINTENANCE
Is Good Sense

● From the standpoint of protecting your existing chimney investment, your plant operation efficiency — and for safety — it pays to keep your chimneys in top condition. International Chimney staff of maintenance engineers and skilled workmen specialize in all types of modern chimney rehabilitation.

Typical of the service offered, the illustrations at the right show the modern method of installing outside reinforcing bands to prevent formation of stress cracks. These bands installed in tension and welded in place eliminate need of unsightly lugs and bolts which will ultimately become loose and ineffective.



International Chimney's Engineering Experts will provide you with time and cost estimates . . . no obligation on your part. Write

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WASTE DISPOSAL PLANT consists of 2 - 26,000 gallon chromate treatment tanks; 2 - 20,000 gallon acid-alkali treatment tanks; 3 - 7,000 gallon cyanide treatment tanks; 1 - 4,000 gallon concentrated alkali tank; 1 - 4,000 gallon concentrated acid tank; 1 - 4,000 gallon concentrated cyanide tank; and 1 - 200,000 gallon settling lagoon.

contain approximately 25% sodium cyanide and once or twice each year must be renewed. The spent salt is dissolved in the concentrated cyanide tank prior to treatment.

Chromate Wastes

The treatment of chromate wastes follows the reaction as shown in these equations.

1st Reaction:

$$3Na_2SO_3 + 3H_2SO_4 + 2H_2CrO_4 \rightarrow Cr_2(SO_4)_3 + 3Na_2SO_4 + 5H_2O$$

2nd Reaction:

$$3Ca(OH)_2 + Cr_2(SO_4)_3 \rightarrow 2Cr(OH)_3 \downarrow + 3CaSO_4 \downarrow$$

The pH of the waste solution is reduced to 2.0 with sulfuric acid. This pH has been found to produce optimum sludge conditions. Keeping the pH between 2.0-3.0, a 10% sodium sulfite solution is added until no hexavalent chromium is found present, using the diphenyl carbazide test. The sulfite reduces the hexavalent chromium to trivalent chromium. The pH is raised to the range of 8.5-9.5 by adding a lime slurry and at this pH range chromic hydroxide and calcium sulfate precipitate. The treated waste is then pumped to the settling lagoon where the precipitates settle out.

The treatment of concentrated chromate wastes follows approximately the same procedure as treatment of the dilute chromate wastes. The only difference is a greater amount of sodium sulfite is required to reduce the chromates and, therefore, the sodium sulfite solution is made up as a 25% instead of a 10% solution.

Cyanide Wastes

The oxidation of cyanides is accomplished by alkaline chlorination. In addition to mechanical agitation of the tanks, additional agitation is accomplished by recirculation through 200 gpm centrifugal pumps. Twenty gpm-pumps draw a portion of the recirculation stream through the chlorinators. Caustic is injected into the chlorinator stream prior to chlorination in the ratio of 1.125 lbs/lb Cl_2. The chlorinators may be used separately to treat two cyanide batches simultaneously.

The reactions in oxidation of cyanides are as shown by these equations.

Equation 1: Oxidation of Cyanides to Cyanates:

$$NaCN + 2NaOH + Cl_2 \rightarrow NaCNO + 2NaCl + HOH$$

Equation 2: Oxidation of Cyanates to CO_2 and Nitrogen

$$2NaCNO + 4NaOH + 3Cl_2 \rightarrow 2CO_2 \uparrow + 6NaCl + N2 \uparrow + 2HOH$$

The laboratory determines the amount of cyanide to be chlorinated and furnishes the operator with the rate of chlorination to use, the strength of the sodium hydroxide solution required in order to maintain the correct ratio of caustic to chlorine and the approximate length of time to chlorinate. After the estimated time of chlorination has elapsed, free chlorine is determined by amperometric titration. If an excess of chlorine results, it is evident that the cyanides have been converted to cyanates as shown by Equation 1. The rate of this reaction is very rapid. Chlorination is discontinued but the waste solution is agitated for another hour. At the end of this hour, another amperometric titration is made to determine free chlorine.

The oxidation of cyanates to carbon dioxide and nitrogen as shown by Equation 2 is much slower than the initial reaction but is considered to be complete at the end of one hour. If free chlorine is found to be present the pH of the solution is then adjusted to the range of 8.5-9.5 At this pH range, any copper and cadmium present in small amounts precipitate out as carbonates, hydroxides, or oxides. The waste solution is tested qualitatively for copper and cadmium, and, if it does not contain these elements, it is pumped to the lagoon.

It is not advisable to treat high concentrations of cyanides in the same manner as dilute solutions, due to undesirable side reactions. A highly toxic concentration of cyanogen chloride builds up in the atmosphere over the solution when a concentrated solution of cyanide is oxidized with chlorine. Also highly explosive and irritating nitrogen trichloride may form. Therefore, when it is necessary to dump a plating tank having a high concentration of cyanides, this solution is caught in the concentrated cyanide tank. Small amounts of this concentrated cyanide solution are added to each dilute cyanide waste batch and treated along with these dilute batches until the cyanide is completely destroyed.

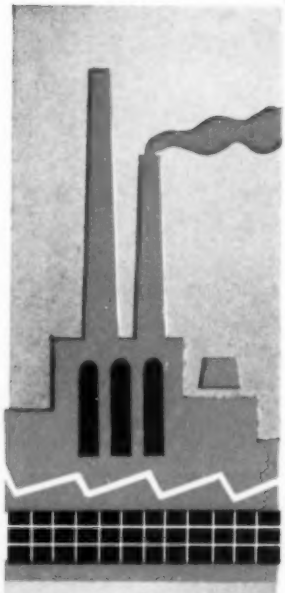
Acid Alkali Wastes

The only treatment necessary for these wastes is adjustment of pH to the range of 7.0 to 8.5. The pH of our plant water is about 8.5 so no attempt is made to neutralize

FOR 100 YEARS . . .
A NAME TO RELY ON

WICKES

RECOGNIZED QUALITY SINCE 1854



FOR ALL INDUSTRY

For almost a century, WICKES Steam Generators have been supplying dependable, low-cost steam to industries and institutions. Today, in every State in the Union and in foreign countries, refineries and natural gasoline plants, steel mills, foundries, ships, chemical processing plants, atomic energy installations, public utilities and many other industries depend on WICKES for efficient steam production. In schools, hospitals, public buildings and institutions, WICKES Boilers supply steam for heat and power.

WICKES can fill your requirements for all types of multiple drum boilers with capacities up to 250,000 lbs. steam per hour at pressures up to 1000 psi., adaptable to any standard method of firing. In pressures up to 900 psi. with sustained steam production up to 40,000 lbs., WICKES Boilers can be shop assembled ready for immediate installation. For complete information, consult your nearest WICKES representative or write us today!

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Waste Disposal Plant in Texas

(*Bell Aircraft's modern unit—starts page 68*)

completely the waste solutions to pH 7.00. Often, no treatment is necessary to bring the wastes to within the desired pH range. However, a demineralized water unit discharges into the acid-alkali drains and during the acid regeneration cycle of this unit considerable acid is released. This is neutralized with a 10% solution of sodium hydroxide stored in the concentrated alkali tank. When the desired pH range is obtained, the waste solution is pumped to the settling lagoon. Concentrated acid or alkaline wastes are caught in the tanks for such wastes and are used for neutralizing dilute wastes.

Final Tests

The control tests for each batch of waste are as follows:

Waste	*Control Tests*
Chromate Wastes	Diphenyl carbazide test (Cr + 6)
	pH
Cyanide Wastes	Free chlorine (Amperometric)
	pH
	Qualitative Cadmium
	Qualitative Copper
Acid-Alkali Wastes	pH (7.0 - 8.5)

Prior to being pumped out of the treatment tank, each batch of waste must be completely treated and pass the tests required. One advantage of a batch treatment process for wastes is that the waste can be held in the treatment tank and treatment continued until it does conform to tests should unexpected quantities of the toxic materials be encountered, or other unforeseen conditions arise.

Each time the settling lagoon overflows, a composite sample is taken for chemical analysis. The date, color, odor, suspended solids, total solids, pH, chemical oxygen demand, qualitative iron, chromium, cyanide, cadmium and copper are determined on this composite effluent.

The tests for color, odor, suspended solids, total solids, and pH are run in accordance with prescribed method in "Standard Methods for Examination of Water and Sewage." Also, the Chemical Oxygen Demand test is a modified version of the "Oxygen Consumed for Permanganate" test for brines given in the same publication. The digestion in alkaline solution has been found to give more consistent results for our particular type of effluent.

The qualitative tests for iron, chromium, cyanide, cadmium, and copper are made on concentrates and are very sensitive. The procedures are those recommended by the Environmental Health Center, U. S. Public Health Service, Cincinnati, Ohio, in the "Advanced Course for Sanitary Chemists in Water Pollution Investigation." Whenever the least bit of doubt exists on the qualitative tests, quantitative tests are made.

The foregoing is a very general outline of the operations at Bell Aircraft. However, each disposal problem has its own particular requirements. Bell Aircraft is also equipped with a complete analytical laboratory which is a consideration when designing a similar unit.

The waste disposal plant was designed with Graham, Crowley, and Assoc., Inc., acting as consultants and was patterned after the Talon, Inc., Plant No. 7 at Meadville, Pa. Cost of construction and equipment was approximately $100,000 plus costs necessary to adapt the unit to present operations. Approximately $50 per day for labor and chemicals are required for treatment of one tank of each type of waste.

Construction Trend in Alabama

(*New materials and methods pay off—starts page 54*)

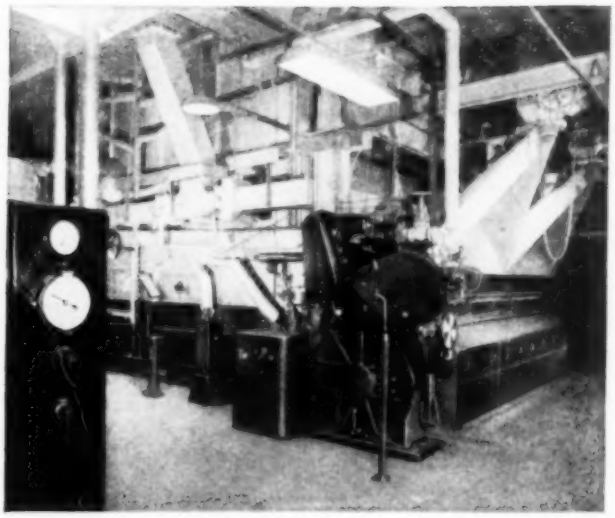
of "free-loading" 80 ft welded H-section roof trusses with 40 ft jack trusses has yielded more than 4,000 sq ft of unobstructed floor space for each interior column. This "high, wide and handsome" interior, with uniform lighting of 30 footcandles provided by semi-continuous fluorescent units at truss height, has given Worthington engineers maximum freedom in the development of mechanized production lines which will be served by a maze of overhead monorail bridge cranes as well as roller and power driven conveyors at floor and bench levels.

Drawing on 24 years of experience in the design of air conditioning plants, Austin has limited the use of windows in the new plant to a vision strip in the one-story aluminum and brick enclosed office and personnel building. Its fluted metal wall sparkles against a background of corrugated asbestos, lending interest to the principal facade of the 640 by 240 ft production building.

Worthington Corporation's unit air conditioner fabricating operations in Decatur, Alabama, will be under the direction of *Russell McBath*, works manager, and *William Johnson*, factory superintendent.

WALL PANELS of 2 in. Tectum fiber insulation used in lengths up to 14 ft provide required thermal control and acoustical correction, plus clean-cut finish at minimum cost.

NATIONAL CASH REGISTER SAVES $70,000 A YEAR WITH MODERN COAL EQUIPMENT!



One of the two new boilers used to supply base steam loads for NCR's plant. Older pulverized coal boilers handle swings.

NCR recently installed two modern, stoker-fired boilers in their Dayton, Ohio plant. They supply the major part of the steam used in generating power for 28 factory buildings and heat for nearly 72 acres of floor space. The savings made have convinced NCR that for high efficiency and low costs, you can't beat an up-to-date bituminous coal-fired installation.

Big Loads! Loads run up to 300,000 lbs. per hour. Annual coal consumption is about 60,000 tons.

No smoking allowed! Located near a residential area with strict control regulations, National uses dust collectors and smoke recorders to make coal clean and convenient.

Additional case histories, showing how other types of plants have modernized and saved money with coal, are available upon request.

Before you build a new plant or remodel your present one, let a consulting engineer show you how a modern bituminous coal installation—tailored to your needs—can save you money.

With modern coal-burning equipment, you can save from 10% to 40% on steam costs. Automatic coal- and ash-handling systems can cut your labor costs to a minimum.

You're set for the future, too, with coal. Coal reserves are virtually inexhaustible. America's highly mechanized coal industry is the world's most efficient. Thus you are assured of a dependable supply of coal, at relatively stable prices, for years to come.

BITUMINOUS COAL INSTITUTE
A Department of National Coal Association
Southern Building, Washington 5, D. C.

If you operate a steam plant, you can't afford to ignore these facts!

BITUMINOUS COAL in most places is today's lowest-cost fuel, and coal reserves in America are adequate for *hundreds of years to come.*

COAL production in the U.S.A. is highly mechanized and by far the most efficient in the world.

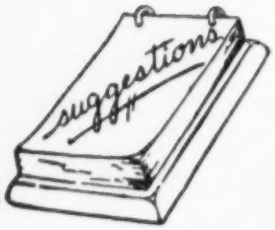
COAL prices will therefore remain the most stable of all fuels.

COAL is the safest fuel to store and use.

COAL is the fuel that industry counts on more and more—for with modern combustion and handling equipment, the inherent advantages of well-prepared coal net even bigger savings.

FOR HIGH EFFICIENCY FOR LOW COST

YOU CAN COUNT ON COAL!



HELPING the *MAN-IN-THE-PLANT*

Ideas . . Methods . . Gadgets

Traveling Screen Operation

PROBLEM: To provide an automatic control that will operate the traveling screen only when required and only as long as necessary.

SOLUTION: Control system (diagrammed) which is based on the differential between water levels, not on absolute water levels.

IN ANY industry using quantities of raw river or lake water, the problem of ridding the water of undesirable and often damaging floatage and other solids is of primary importance. Cleaning is usually accomplished by means of a traveling screen that removes trash from the water and deposits it in a disposal area.

Debris accumulates at the screen—in fact a heavy litter may stop up the screen if its speed of rotation is not great enough. Thus, unless the traveling screen is operated at the maximum speed necessary to remove the heaviest predicted accumulation, a varying time or speed of screen operation is required.

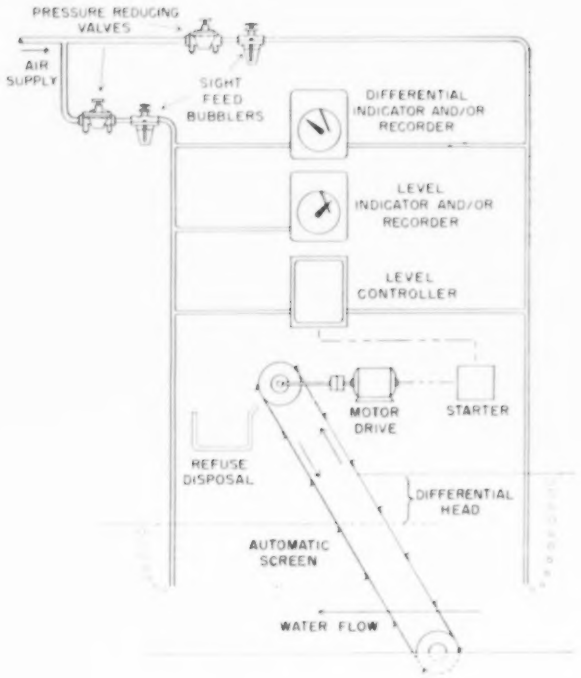
The problem is to provide an automatic control that will operate the traveling screen only when required and only as long as necessary.

Control Operation

When debris clogs the screen it slows up the flow of water through the screen—and consequently the water level behind the screen drops. The difference between the water levels is the differential head used to actuate the control system (see sketch).

The level controller is connected to two pipes that extend below the lowest level to which the water ever drops. Air, under pressure, flows through both pipes at a set rate adjusted by means of a control valve and sight-feed bubblers. The difference in air pressures required to bubble air through both pipes is the measurement of the differential head between the two water levels.

When a predetermined maximum differential head is reached the level controller trips its "start" contact —starting up the traveling screen. As movement of the traveling screen cleans away the debris, the water flow is increased and the two water levels tend to become equal. When the differential between these two levels reaches a certain minimum head, the "stop"



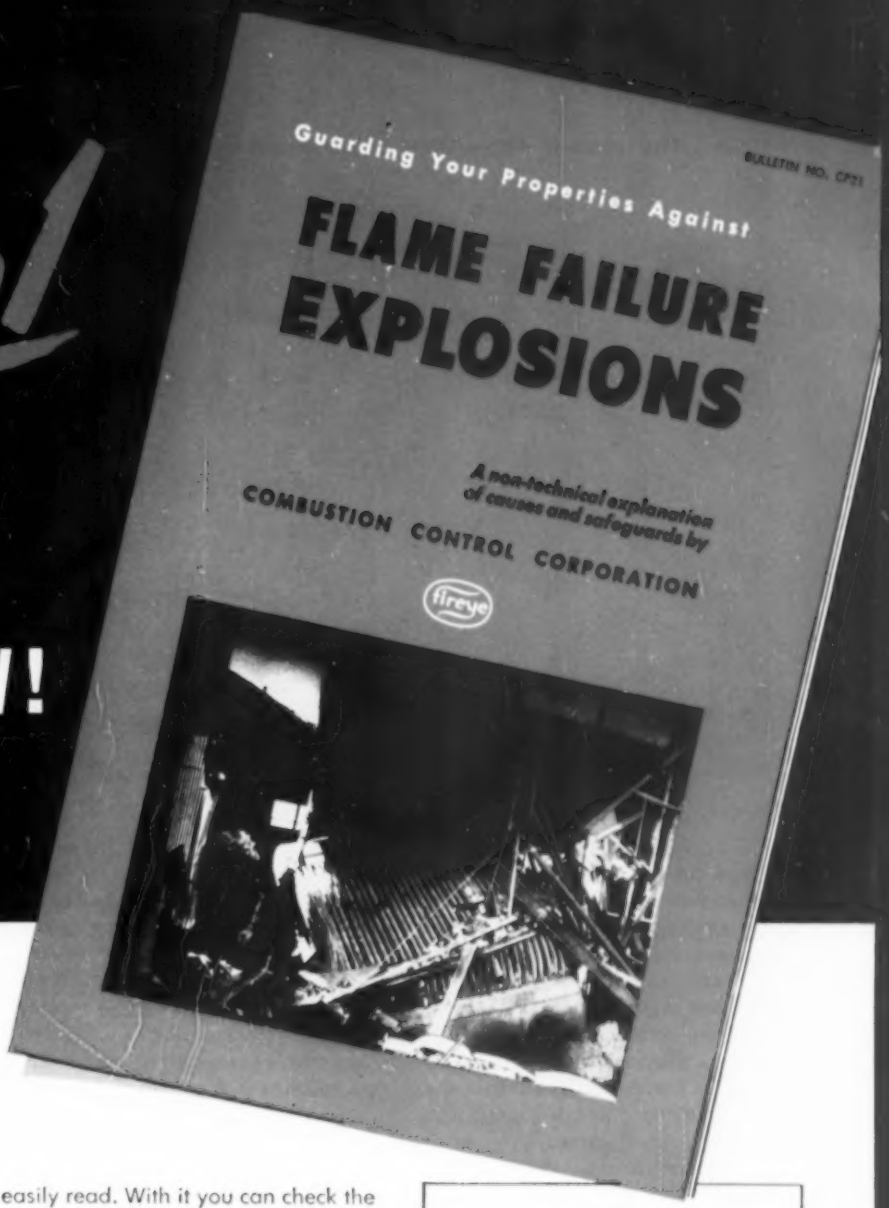
contact of the controller is tripped and the traveling screen comes to a halt. For instance, the control could be set to start the screen when the water level behind the screen dropped 10 inches below normal. The screen would operate until the differential was reduced to 3 inches, at which point the controller would stop the screen.

The effect of tides and high or low water is of no consequence because the control system is based on the *differential* between water levels, not on absolute water levels.

This same system can also be used for (1) A differential indicator and/or recorder, calibrated in inches of water; (2) An indicator and/or recorder of absolute water depth either in front of or behind the screen.

Adapted from *Fuel Economy News* with permission of The Hays Corporation, Michigan City, Indiana, manufacturers of combustion and industrial instruments and controls.

It's 4-to-1 you need to read this booklet NOW!



Records show the chances are 4-to-1 you are NOT protected against explosion hazard, if you burn fuel for heat, power, or processing.

WHEN A BURNER flame fails without instant cut-off of fuel, an explosive mixture collects . . . and may ignite disastrously on hot firebricks. A delay of only 30 seconds can spell tragedy, yet most "safeguards" in use today simply do not act that fast!

What can you do for proper protection . . . ?

You can do a great deal, easily, inexpensively. First, send for this free booklet. "Guarding Your Properties Against Flame-Failure Explosions" is a primer on such hazards, quickly and easily read. With it you can check the protection you now have, and determine the protection you really need. Money-wise it could prove to be the most important booklet you've ever read.

PLAY SAFE! SEND TODAY!

Fire insurance records show that flame-failure explosions happen regularly . . . and **they are costly.** Consider that your properties may be next, and mail the coupon *now!*

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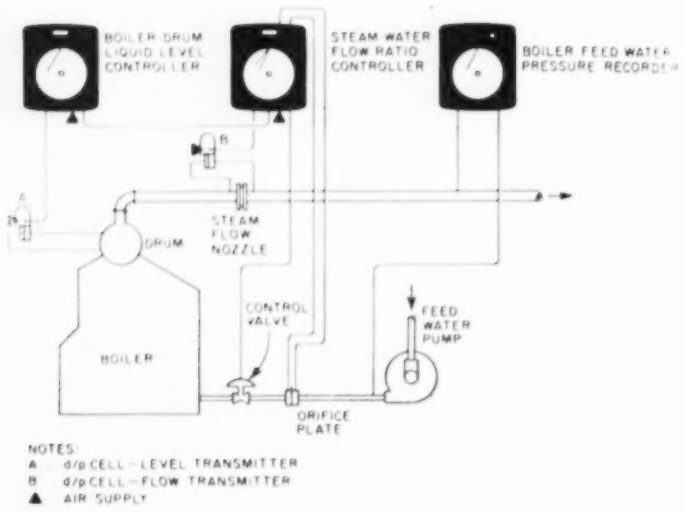


Boiler Feedwater Control System

TO prevent dangerous carryover and low boiler levels, a Texas copper refining plant has installed a completely automatic boiler feed control system which ratios feedwater to steam consumption. Designed by The Foxboro Company, the instrumentation not only supplies feedwater at a rate dictated by boiler load changes, but automatically corrects any true increase or decrease in drum level, disregarding "swell" and "shrink."

Prior to the installation, automatic control was impossible on start-up until pressures reached 75 psi. In order to put a boiler on steam, the operator had to watch conditions very closely. Even with the boiler in operation, drum level control was unstable, and unable to handle sharp load changes.

Automatic System

As diagrammed, the new system consists of a Foxboro Flow Ratio Controller operating the feedwater control valve to keep the proper ratio between flows of steam and water, and a Foxboro Liquid Level Controller which adjusts this ratio to correct drum level variations.

In the event of a substantial increase in boiler load, more feedwater should enter the boiler to maintain the steam-water ratio. But, because "boiler swell" is also occurring, causing the drum level to increase, any added water would further upset this level. For this reason, delay is introduced into the steam flow measurement to the Flow Ratio Controller. This gives the "boiler swell" time to subside before the instrument can increase the feedwater rate in response to high steam demand. The Level Controller is similarly delayed so that it will not change the ratio of water to steam on the basis of the false and temporary level created by the "boiler swell."

Measurements of feedwater flow, steam flow and drum level are pneumatically transmitted to the recorder-controller by mercury-less Foxboro d/p (differential pressure) Cells. Continuous records of steam and feedwater pressures are charted by a Foxboro 2-pen Pressure Recorder.

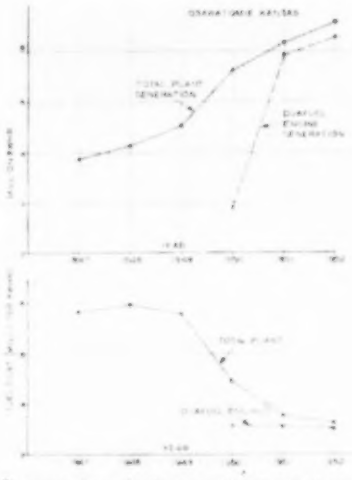
Operators report that the new system, completely automatic, requires no attention. Boiler slugging, with its problem of carryover, has been eliminated. Load changes, whether severe or normal, initiate their own feedwater corrections at the proper time, and no violent cycles can occur. Water in the drum is thus maintained at optimum level for all boiler operating conditions.

Low Power Costs For Municipal Plant

FOR many years the municipal water and electric plants at Osawatomie, Kansas, were located on the flood plain of the Osage River where occasional flash floods would put the plant out of commission. In 1939, Osawatomie moved its utilities away from future floods by building a new Diesel-engine generating station and water works plant on high ground. The value of this move was demonstrated during the 1951 flood when drinking water and electrical energy were available at all times in spite of the record high water.

While the construction of a new plant got rid of the flood danger, the rising cost of fuel oil was another serious problem. Natural gas was available and Nordberg four-cycle supercharged Duafuel engines provided the economical answer to the high-fuel-cost problem.

The first Nordberg engine rated 1750 hp, 1235 kw at 327 rpm. went into operation in July 1950. The fuel cost reduction with the use of this unit was so marked that an oil burning Diesel engine was re-



Increased production and lower kwh cost go hand in hand at Osawatomie, Kansas

pd Stacks

for many of America's

most efficient

Power Plants

The wheels of industry move on *power*—generated by power plants that must produce economically, be trouble-free and operate for long periods with a minimum of maintenance.

Efficiency of the boiler is vital . . . stacks must insure this efficiency with a minimum of heat loss, must guarantee predetermined draft production, must assure correct static pressure at all times.

Stack efficiency often means boiler efficiency. That's why many of America's most efficient power plants are Prat-Daniel equipped.

These power plants specified P-D Stacks because:
1. Breeching, fan and stack are built as *one* unit.
2. Losses due to breeching bends are eliminated.
3. Predetermined draft production can be guaranteed.
4. P-D stacks are designed to fit specific power needs.

In the design illustrated, for example, two fans are utilized for widely fluctuating loads. Each fan handles approximately 70% of total volume. Second fan may be automatically cut in. The one stack may be used on two boilers.

Our project engineers—The Thermix Corporation—are experts in fan-stack and flyash collection applications. Consult them for the answer to your draft problems. Ask them for the Prat-Daniel Fan Stack Catalog.

Project Engineers

THE THERMIX CORPORATION

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Designers and Manufacturers

PRAT-DANIEL CORPORATION

SOUTH NORWALK, CONN.

POWER DIVISION: Tubular Dust Collectors, Forced Draft Fans, Air Preheaters, Induced Draft Fans, Fan Stacks.

moved in the spring of 1952 and another identical Nordberg unit installed in its place. This second unit started operation in July 1952.

Operating data from this plant for the five-year period 1948-1952 inclusive shows the savings resulting from the switch to Duafuel operation. On the basis of the current nine cent fuel oil and the prevailing gas rate, the plant fuel cost dropped from 7.96 mills per kwh when burning fuel oil only in 1948 to 3.27 mills in 1952 using the Nordberg Duafuel engines. The fuel cost for the Duafuel engines during 1952 was only 3.05 mills per kwh. According to Mr. James Higgins, superintendent of utilities at Osawatomie, the lubricating oil consumption is also extremely low. The first Nordberg engine installed shows an average of 9,550 rated brake horsepower hours per gallon of lubricant during 18,376 hours of operation over a 2½ year period.

Clarification of Turbid River Water

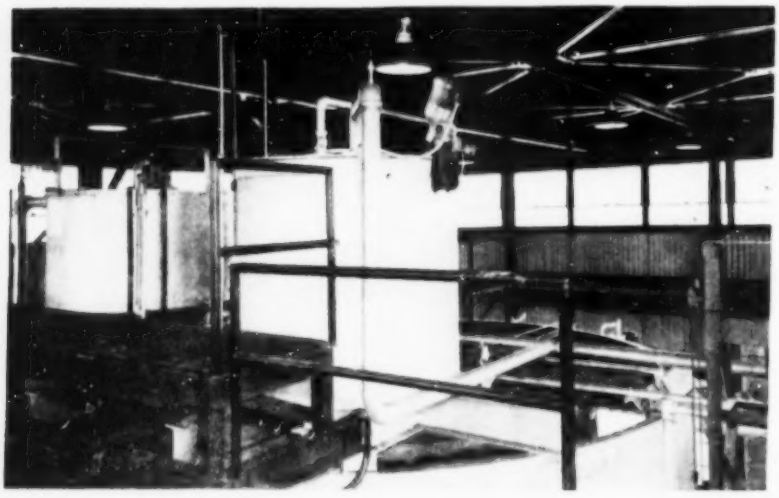
A GRAVER Reactivator is used at Georgia Power Company's generating station, Plant Yates, located near Newnan, Georgia, for the rapid clarification of boiler feedwater makeup taken from the Chattahoochee River.

With turbidities ranging from 14 to 2000 ppm and the pH varying rapidly between 6 and 8, there was an obvious need to reduce the solids and stabilize the water suitably for makeup to evaporators in order to maintain the expected efficiency of the evaporators and to minimize the shutdowns for cleaning.

At an appreciable savings in construction costs, the rapid clarification method was selected over the slower conventional coagulation and settling methods to conserve space and to assure extremely flexible operation in keeping pace with the rapidly changing characteristics of the raw water supply.

For this reason a Graver Reactivator was installed. Occupying only a 23 ft diameter area, the unit is producing 400 gpm of clarified water having less than 10 ppm turbidity in the effluent in one-third the space normally required for the older system having separate coagulating and settling basins designed with long retention periods. Automatically controlled, the pH is kept within specified limits through all the variations in the water supply.

Portion of installation of Graver Reactivator, 23 ft diameter by 13 ft high, at Plant Yates of Georgia Power Co. View from operating platform.



Piston Ring Combinations

SEVERAL new piston ring combinations for diesel and gas engines are answering the need for piston rings that will allow the engine to give maximum performance and economical operation.

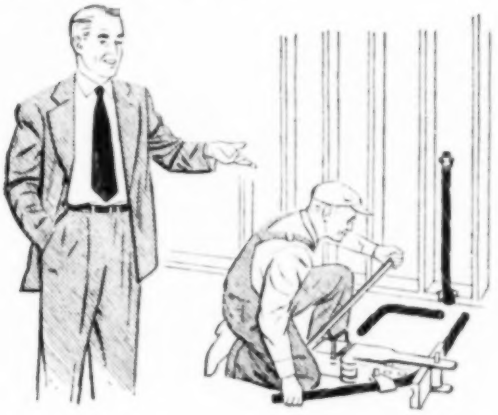
A New Mexico oil company had been obtaining 1,640 hp-hr/gal of lube oil in an engine equipped with conventional rings. Since installing a complete Double Seal ring combination, including flexible ventilated oil rings with ribbon abutment expander (Flexvent) the hp-hr/gal of lube oil for this same engine have increased to 13,000.

The oil rings used in the new ring combinations (Double Seal Ring Company, Fort Worth, Texas) are double scraper flexible ventilated oil rings with abutment type expanders. This oil ring is available with the ribbon abutment type expander for diameters of 9" and over and in the coil abutment type for diameters of 4" and up. These oil rings have two narrow, undercut scraping edges and are very flexible because of the reduced cross section. This flexibility enables the abutment expander to force the ring to conform to the cylinder wall immediately. The expander gives permanent tension to the ring and this plus the fact that the scraping edges are undercut and remain sharp makes for long ring life and economy.

Sectional view of Double Seal Ring's Flexvent—a double scraper flexible ventilated oil ring with ribbon abutment expander.

The LONGER LIFE of WROUGHT IRON PIPE

proves...



It costs less to do it right

—than to do it over!

When you specify pipe there are two things well worth remembering—

1. When you install it, you pay only the pipe fitter,

but

2. Every time you repair it, you pay pipe fitter, carpenter, mason, plasterer, and painter.

This dollars-and-cents difference underscores the fallacy that low-first-cost materials are the answer to piping economy. And these same facts provide a yardstick that places the economy emphasis where it rightly belongs . . . on PIPE SERVICE LIFE. The longer service life of wrought iron pipe has proved to thousands of users that it costs less to do it right than to do it over. In installation after installation, wrought iron pipe has doubled, tripled, and even quadrupled the useful life previously obtained from low-first-cost piping. These users have discovered that although you pay a little more for wrought iron, you pay a LOT LESS FOR MAINTENANCE. Wrought iron gives you piping economy because it lasts longer, at lower cost per year.

We'll welcome the opportunity to discuss your particular corrosion problems, and to show you wrought iron durability records in services similar to those in which you are interested. Write or call. Your request will be handled promptly.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Department: New York, N. Y.

Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glasslike silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

Load distribution trend—1950, '51, and '52—at the Greenwood Light and Water Plant, Greenwood, Mississippi

Load Change Cuts Maintenance Time

DURING the past several years air conditioning has had a considerable effect on the operation of many municipal power plants, including the Greenwood Light and Water Plant at Greenwood, Mississippi.

Greenwood is a city of 20,000 in the delta region of Mississippi. Main industry is cotton growing. Until a few years ago the only seasonal load swing was caused by cotton gins, compresses and oil plants. However, air conditioning has recently had a considerable effect on load distribution. The accompanying chart shows just what has happened during the past three years.

Note that the peak is now earlier in the year. In 1950 it was October 20th; in 1951 it was October 5th; and in 1952, August 22nd. This change in peak load has cut down on the plant's maintenance time. We have considerably less time in the spring to accomplish annual overhaul. This may mean that the plant will have to keep a larger staff of maintenance men or trust to the type of temporary help that can be hired.

A second look at the chart will show that the peaks are also more pronounced. The yearly load is not as uniform as it used to be. In 1950 the maximum peak was 40.8% higher than the minimum; in 1951 it was 45.2%; and in 1952, 49.5%.

This increase in peaks lowers the plant load factor. This will undoubtedly increase the plant's capital costs. Equipment purchased to supply this peak seasonal load will be idle or at part load the rest of the year.

Probably the best solution for municipal power plants of this type would be to exert greater effort to sell additional power during the winter months (heating, cooking, etc.). This would tend to balance the summer and fall peaks and leave the spring for maintenance operations.—*D. H. Marshall, Asst. Supt., Greenwood Light and Water Plant, Greenwood, Mississippi.*

Scale Removal From Economizers

A VIRGINIA railroad reports outstanding results after chemical cleaning of boiler economizers by Dowell Incorporated. The units serviced were the economizers on three B & W Type F Integral Furnace Boilers of 70,000 pph capacity at 225 psi.

Scaling Condition

The economizers were of a continuous tube, serpentine type with thirteen parallel 2" x 460' tubes which ended in top and bottom box headers. Capacity of each economizer was 700 gallons. The design of these economizers made mechanical cleaning methods impossible.

All three units were badly scaled. Tube openings at the top headers averaged only 1" I.D. Laboratory analysis of scale samples showed approximately 60% calcium carbonate, 5% iron oxides and the balance in phosphates.

Cleaning Method

Each unit was cleaned in three stages using Dowell inhibited solvents. During the first stage, 150-200 gallons of solvent were pumped into the cold units. After a short soaking period an additional 150-200 gallons of solvent were added. This process was continued until total contact time for this stage was about four hours. The second and third stages consisted of additional Dowell solvents which were heated and alternately circulated and allowed to soak. Each unit was then flushed and treated to neutralize the solvents and passivate the metal.

Performance

Following chemical service the economizer headers were opened for visual inspection, and all tubes were found to be metal clean. Before this service was performed the average pressure drop across the economizers was 70 psi at peak load down to 45 psi at lower loads. After chemical cleaning the average pressure drop was 4.5 psi at peak loads down to 1.5 psi at lower loads. Performance of these units was improved to the extent that one feedwater pump formerly used could be taken out of service. Periodic cleaning on an annual basis was planned by the operator for the entire boiler, superheater and economizer units.

$$$ For Your Ideas

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material—a photo or rough sketch will make your idea more valuable.

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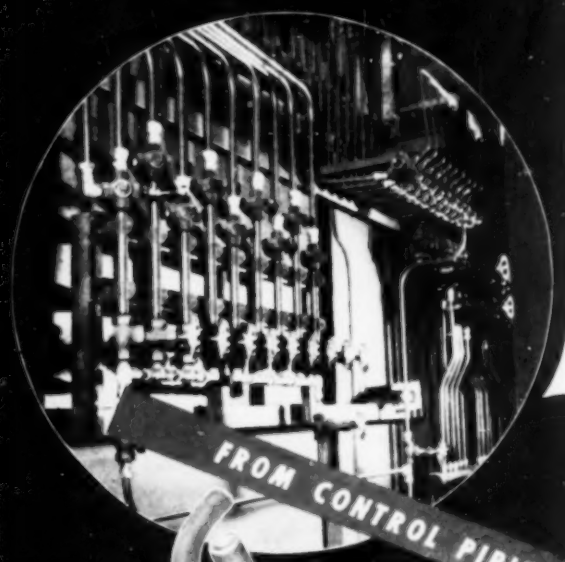
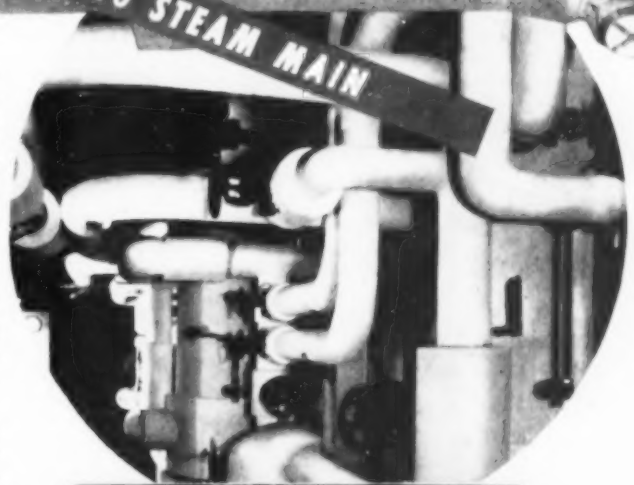
WHEN THE PRESSURE IS ON P.P.&E. PIPING

has what it takes



FROM CONTROL PIPING TO STEAM MAIN



Today's 1000°F and higher temperatures, combined with pressures in the 2000 psi range—really "put the pressure" on a piping system. It could be said that these higher, and perhaps even higher pressures to come, will force new standards of piping.

But—remember when 750°F was considered to be a high reheat temperature? Even then, P.P.& E. was ahead of the needs in piping to carry the load. As the trend toward higher temperatures continued—P.P.& E. has kept ahead of the requirements.

That's why conditions encountered in present-day reheat temperatures are thoroughly understood by P.P.& E. engineers—and why adequate materials, design know-how, methods of treating and fabricating, and testing procedures are available.

When the "pressure is on" you can depend on every part of a P.P.& E. piping system—from the steam main, right down to the air lines.

Pittsburgh Piping
AND EQUIPMENT COMPANY
10 Forty-Third Street—Pittsburgh, Penna.

Atlanta ..... Whitehead Building
Boston ..... 10 High Street
Chicago ..... Peoples Gas Building
Cleveland ..... Public Square Building
Houston ..... Heights State Bank Bldg
New Orleans ..... P. O. Box 74
New York ..... Woolworth Building
San Francisco ..... 785 Market Street

Three Handling Operations Eliminated

NEW materials handling equipment — "Trackless Trains" — eliminate three major handling operations and speed the moving of packaged sugar at the American Sugar Refining Company at Arabi, La. Loading and unloading freight cars, which are no longer used, eliminate two of these handling operations. A third operation, unloading packaged sugar from freight cars and temporarily storing it in warehouses, is no longer necessary as the "Trackless Train" now hauls sugar direct to the dock.

The major handling problem at the plant is the long haul from the refinery packing room to the river barges at the loading dock, a distance of approximately 1500 ft. The scope of the problem becomes evident when it is considered that up to 4,000,000 lb of sugar are produced and shipped daily.

Old Method

Formerly, sugar was loaded into railroad freight cars at the packing room and transported over the company's tracks by switch engines to warehouses at the loading docks. Here, the cars were unloaded, either into temporary storage or onto trailers. If loaded onto trailers, an overhead towline system conveyed the trailer to the dockside. When temporarily stored, two more operations (unloading and reloading) were necessary before packaged sugar reached the dock.

A Mercury Manufacturing Company "Trackless Train," consisting of six caster-wheel trailers pulled by a gasoline tractor, moves packaged sugar from American Sugar Refining Company's plant to dockside in approximately half the time formerly required.

New Technique

Today, the handling procedure is as follows: Filled and sewed bags of sugar come down gravity chutes from the packing floor to the loading platforms. The sugar, shipped in either 100 lb bags or in 60 lb bales of 5 and 10 lb packages, is loaded onto trailers and hauled by tractors to the loading docks. The tractors in use here are the "Huskie" 53 hp model, manufactured by Mercury Manufacturing Company. These tractors haul trains of A-310 trailers, also manufactured by Mercury.

Fully loaded "Trackless Trains" must maneuver around three sharp curves getting out of the packing room. Once out of the packing room they go over three sets of railroad tracks and around long curves in a covered concrete ramp leading to the river barges. Near the unloading point it is necessary for the loaded train to climb a steep levee incline, which is approximately 100 ft long.

At dockside, the tractor pulls the trailers into position alongside river barges. Tractors are released from the loaded trailers and take a train of empty trailers back to the packing room. Sugar is unloaded by dock hands and dropped into chutes which guide it into the barge.

In addition to the "Huskie" tractors used in transporting sugar to the loading docks, a fleet of Mercury's "Banty" tractors are used to handle sugar being shipped by rail. "Trackless Trains" with four trailers are hauled by the "Banty."

In the production of Domino Sugar, extensive supplementary use is made of the trailers in maneuvering cartons, bags, packages, supplies and equipment throughout the plant. The advantage of these trailers is the flexibility they provide for both the "Trackless Train" and for manual handling. One example of this is positioning a load of empty cartons exactly where they are needed and then wheeling them out of the way when they are no longer required.

$$$ For Your Ideas

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material—a photo or rough sketch will make your idea more valuable.

Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

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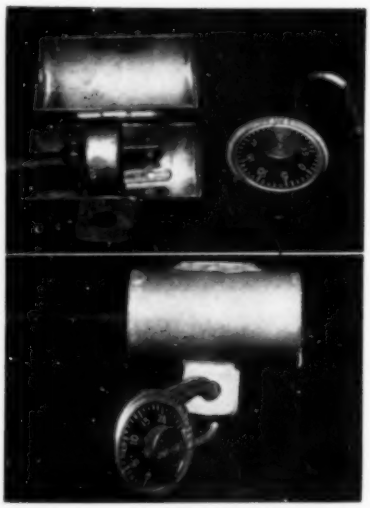
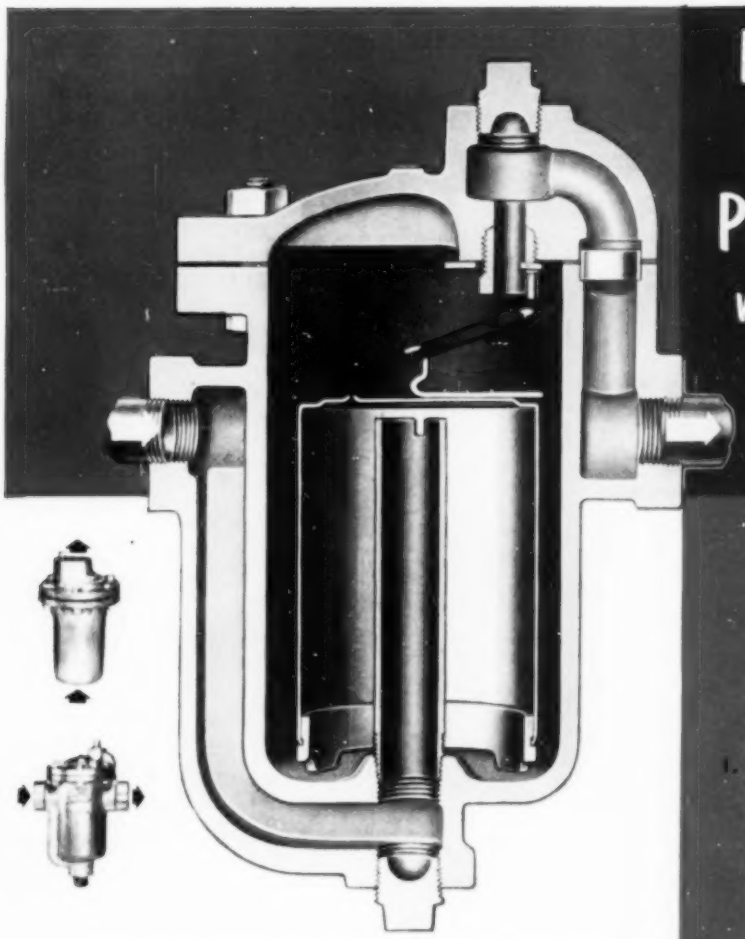
806 Peachtree St., N.E.
Atlanta 5, Georgia



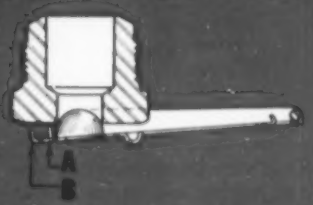
Extension Cord Lockout Device

AT Du Pont's Waynesboro, Virginia, plant, this gadget prevents the placing of a plug into an electrical receptacle while maintenance work is being performed on the equipment. Plant electricians report that it is particularly useful on electrical office equipment, power tools and laboratory apparatus where locking type switches are not provided.

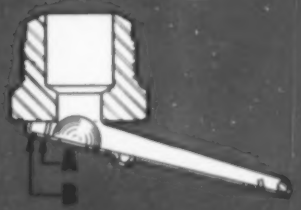


MORE TRAP CAPACITY PER DOLLAR with Armstrong two-phase leverage

HOW IT WORKS:



1. Valve in closed position.



2. As the bucket starts to sink, the lever fulcrums at "A", giving high leverage to open the valve against pressure. When valve is well open, the secondary fulcrum "B" touches the face of the valve seat.

3. Additional bucket travel results in fulcrum "B" becoming the pivot, permitting the valve to be opened wider so that restriction to flow of condensate is minimized.

Two-phase steam trap leverage is an original development by Armstrong and has been incorporated in Armstrong traps since the memory of most engineers runneth not to the contrary. It provides:

1. High initial leverage to open the valve against pressure.
2. Secondary lower leverage which permits the valve to travel well clear of the seat to minimize restriction to flow of condensate.

A single-phase lever can open just as large a valve *or* give just as great valve travel, *but not both.* Thus, Armstrong two-phase leverage gives very much greater capacity, depending on trap size than the earlier leverage system.

No steam trap gives greater actual hot condensate capacity, size for size, and dollar for dollar, than an Armstrong!

For complete data call your local Armstrong Representative or send for the 44-page Steam Trap Book.

ARMSTRONG MACHINE WORKS
806 Maple Street, Three Rivers, Michigan

ARMSTRONG STEAM TRAPS

NEWS *for the South and Southwest*

Georgia Power Personnel Changes

E. FAY PEARCE, manager of the industrial power division of the GEORGIA POWER COMPANY since 1946, has been named assistant to C. M. WALLACE, JR., vice president in charge of sales, according to Harllee Branch, JR., president.

At the same time, Branch announced the creation of a new commercial sales engineering division, combining business and industrial lighting with other commercial applications of electric power. This section will be headed by JOE B. BROWDER, manager of the company's lighting division, and formerly Atlanta division sales supervisor.

Pearce will be succeeded as manager of the industrial power division by BEN R. ASKEW, who had served as industrial power specialist since 1945. ROY W. WAGES, Columbus division power sales engineer, will be transferred to Atlanta to succeed Askew.

JAMES H. MCGUIRE, Atlanta division residential sales engineer, who has been assigned to the office of the vice president and general manager on special work for the past two years, was appointed sales research engineer, a newly-created post.

Worthington Corp. Receives Key to Decatur, Ala., Plant

HOBART C. RAMSEY, president of the Worthington Corporation, receives the symbolic key to his company's new Decatur, Alabama, plant from GEORGE A. BRYANT, president of The Austin Company. Presentation was at a civic luncheon November 20th following their inspection of the new facilities.

Production of 3, 5, and 15 ton packaged cooling units is scheduled early this year in the 170,000 sq ft factory designed and constructed by The Austin Company.

Factory construction techniques, showing how new materials and methods paid off in speed and value are featured in this issue of SP&I. Use of movable tilt-up concrete panels in a curtain wall; giant fiber insulation

Mr. Ramsey (left) and Mr. Bryant

panels; and six air conditioning platforms—raised into position in truss area with fans, coils, filters already in place, helped construction engineers to have the modern factory 95% complete in 123 working days.

See page 54 for construction highlights.

General Electric's Transformer Plant at Rome, Georgia, Nearly Finished

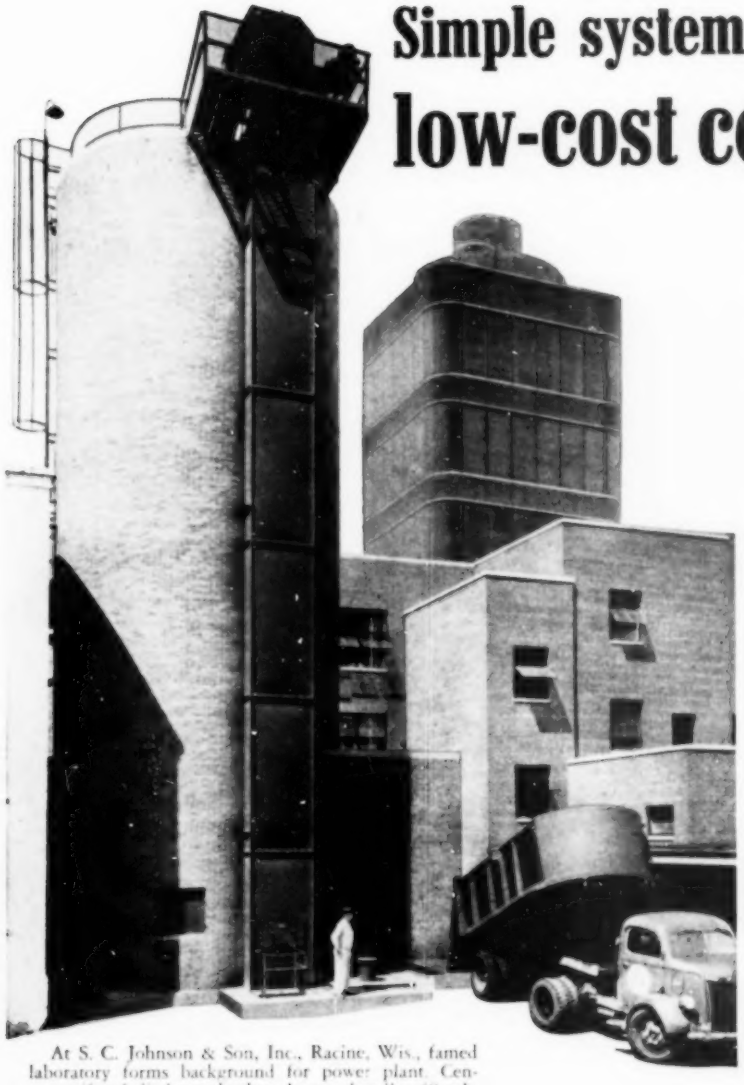
CONSTRUCTION is nearly complete on the GENERAL ELECTRIC COMPANY'S 25-million-dollar transformer plant at ROME, GA. Some manufacturing processes have already begun at the plant and the first transformer is scheduled to be shipped during January, 1954.

The large building in the foreground of this aerial photograph is the main manufacturing plant. In the center background is another manufacturing building. The administrative offices will be housed in the building at left behind the main manufacturing structure.

The plant will eventually employ 1,700 persons. Power transformers weighing from 3 to 30 tons each and rated 501 kva to 10,000 kva will be produced at the plant. A new "near-conveyor type" manufacturing system will be used to make this electrical equipment.

DAVID D. LAWTON is the Rome, Georgia, plant manager; T. F. VOLKMER is manager of engineering.

Simple system spells low-cost coal handling for small power plant



At S. C. Johnson & Son, Inc., Racine, Wis., famed laboratory forms background for power plant. Centrifugal discharge bucket elevator handles 40 tph.

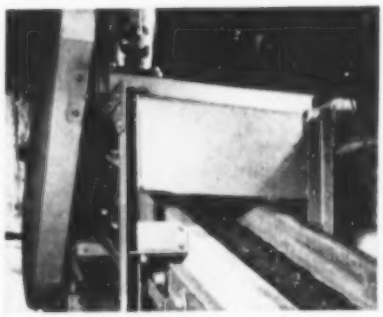
LINK-BELT equipment at S. C. Johnson & Son, Inc. provides clean, efficient operation

THE compact, economical coal handling provided for the makers of Johnson's wax is typical of hundreds of Link-Belt power plant installations. Large or small — your plant, too, can get the added efficiency of modern, mechanized equipment.

Link-Belt's experience is based on years of success in meeting every type of coal handling problem. This vast background, combined with a complete line of coal handling equipment, is your assurance of a system that's right for your needs. And Link-Belt's quality products have earned a reputation for dependable, long-life service. See your nearest Link-Belt office for a copy of Book 2410, showing many typical, modern power plant layouts.

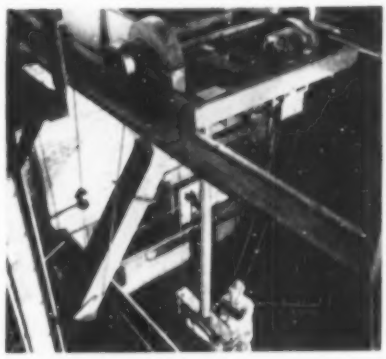
LINK-BELT
COAL HANDLING EQUIPMENT

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarboro, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices in Principal Cities 53.1010

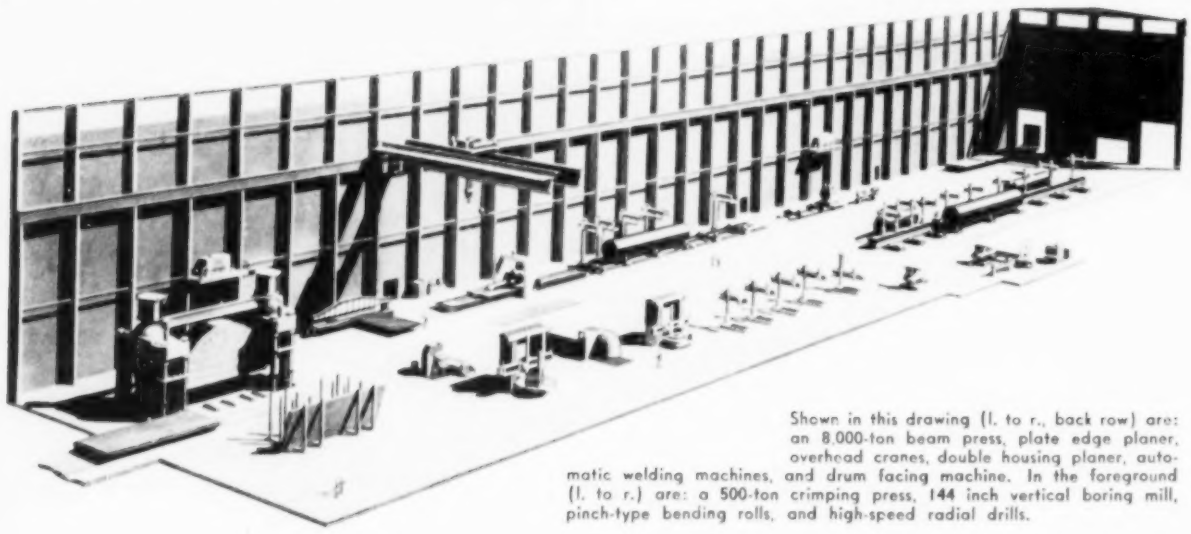


Apron conveyor loads bucket elevator. Live or dead storage is fed by elevator.

From elevator, coal is moved by 12 in. screw conveyor atop storage silo.



Weigh larry delivers coal from discharge chute to three stoker hoppers.



Shown in this drawing (l. to r., back row) are: an 8,000-ton beam press, plate edge planer, overhead cranes, double housing planer, automatic welding machines, and drum facing machine. In the foreground (l. to r.) are: a 500-ton crimping press, 144 inch vertical boring mill, pinch-type bending rolls, and high-speed radial drills.

Foster Wheeler Starts Production in New Heavy Equipment Plant

FOSTER WHEELER CORPORATION, manufacturer of heavy equipment for steam power plants, oil refineries, and process industries, has begun limited operations at a new plant near Wilkes-Barre, Pa.

Equipped with the most modern fabricating tools, the $5,000,000 plant will turn out pressure vessels of varying proportions, including some of the largest and heaviest in demand. Part of an $8,000,000 expansion and retooling program begun three years ago, the new plant will also help to relieve heavy manufacturing schedules at the corporation's other plants in Carteret, N. J., Dansville, N. Y., and St. Catharines, Ontario, Canada.

Among its major tools will be an 8,000-ton hydraulic beam press weighing over three million pounds and said to have an effectiveness in bending steel plate—hot or cold—seldom before equalled. Largest of its type yet made, the press is capable of bending plate eight inches thick, and (in the case of lighter plate) forty feet long into half-shells which, when welded together, will form pressure vessels of the unusual proportions required for the higher pressures demanded by various industries.

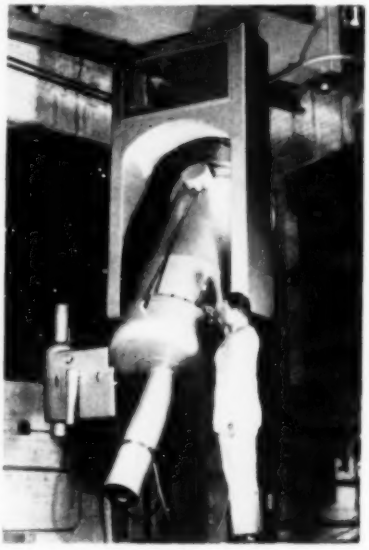
Another outstanding tool will be a 2-million-volt X-ray generator capable of penetrating steel 12 in. thick. The machine will photograph weld metal with unprecedented clarity of detail, exposing any minute flaws that may occur in the metal. This will be the first application of super-voltage X-ray in private industry.

Other special tools that will make up the new plant, although basically similar to many used in other steel fabricating plants, are unique in their capacity to perform monumental operations, or in their ability to perform familiar tasks automatically, and more efficiently. Among these are:

A new system of automatic shielded arc welding whereby vessels up to 8 in. thick and 12 ft in diameter may be welded at speeds considerably greater than in single-wire welding.

A plate handling device that positions, accurately and without appreciable loss of metal temperatures, the huge slabs of preheated steel that will be formed in the beam press.

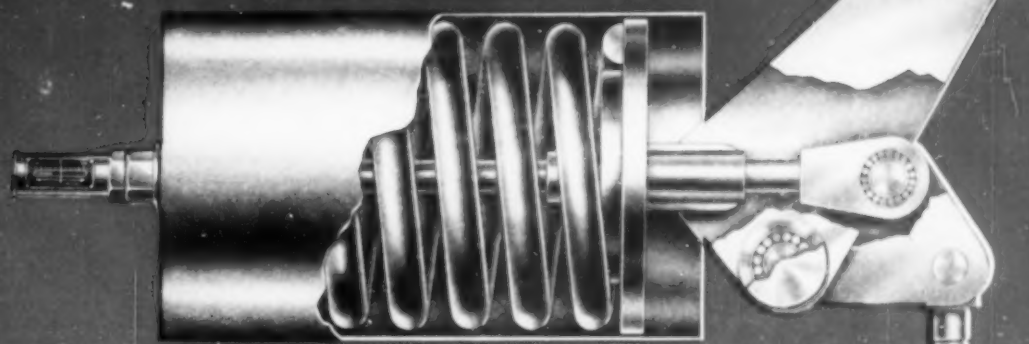
A series of mobile, high-speed radial drills that may be stationed anywhere along a 230 ft stretch of raised track. The drums to be drilled may be placed on either or both sides of the drill platform. The arrangement makes possible the use in combination of as many as six drills on a single cylinder.



First super voltage X-ray machine of its type to be used in industrial radiography, this 2-million volt Van de Graaff generator is capable of penetrating steel thicknesses up to 12 in. It will be used to photograph weld metal for the purpose of detecting any flaws that may occur in such material during the fabrication of high pressure vessels.

Among the products to be fabricated are such varied equipment as heat exchangers for nuclear power; sections of oil towers and pressure vessels weighing over 100 tons, and equipment for jet engine regenerators, some of it weighing up to 140 tons.

You Get Time-Tested Dependability With



NAVCO Counterpoise*

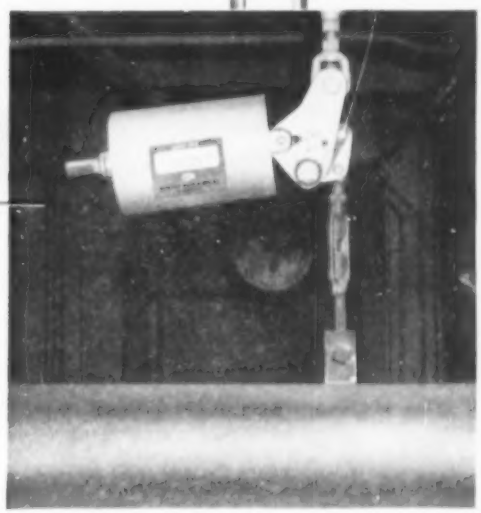
Pipe Hangers

The constant load-carrying capacity of Navco Counterpoise* Pipe Hangers has been proven during an extended period of satisfactory service as the first accurate and efficient support for high temperature piping systems. They are being used extensively in steam generating stations, refineries and chemical plants.

The Counterpoise Hanger is a spring-actuated counterbalance. An ingenious system of linkage transforms the varying force of the spring in an accurate mathematical ratio to produce a load supporting effort of constant value throughout the entire range of expansion travel.

The design permits great flexibility of installation and saves valuable space in congested areas. All parts are ruggedly made and have a high safety factor, yet excess weight and oversize physical dimensions have been avoided to hold space and structural load requirements to a minimum.

The Navco Counterpoise Hanger is available in 16 different frame sizes with load capacities ranging from 200 to 16,000 pounds and expansion travels up to 12 inches. For detailed information on how you can get dependable support with this unique hanger, write today for our 12-page illustrated bulletin #153.



Note above how the flexible top connection permits the hanger assembly to fall in line with the direction of the load pull, so that horizontal travel of the piping has no appreciable effect on the hanger operation. The unit may be positioned at any angle. This affords flexibility in installations where close clearances are a factor.

**Counterpoise is a trade name of the National Valve & Manufacturing Company*

NAVCO

NATIONAL VALVE & MANUFACTURING COMPANY

3106 LIBERTY AVENUE, PITTSBURGH 1, PENNSYLVANIA

New York • Chicago • Cleveland • Boston • Atlanta • Buffalo • Cincinnati

news for the South and Southwest (*continued*)

ASME—1954 Officers

The 1954 president of American Society of Mechanical Engineers is LEWIS K. SILLCOX, honorary vice-chairman of the board of The New York Air Brake Company.

The regional vice presidents are WILLIS F. THOMPSON, vice president, Westcott & Mapes, New Haven, Conn.; Prof. WILLIAM G. MCLEAN, head of the Department of Mechanics, Lafayette College, Easton, Pa.; THOMPSON CHANDLER, chemical engineer with the Carbide & Carbon Chemical Corporation, South Charleston, W. Va.; VERNON A. PETERSON, district manager for the Elliott Company, Los Angeles, Calif.; and Prof. CLIFFORD H. SHUMAKER, director of the Institute of Management, Southern Methodist University, Dallas, Texas.

Directors-at-large are FRANK L. BRADLEY, plant engineer, Forstmann Woolen Company, Passaic, N. J., and ROBERT B. LEA, coordinator of exports, the Sperry Corporation, New York.

Lunkenheimer Holds Sales Training School

Distributor sales representatives from seven states attended an intensive two-day sales training course at THE LUNKENHEIMER CO., Cincinnati, Ohio, recently.

The conference was attended by 32 sales representatives from 13 Lunkenheimer distributors in Connecticut, Indiana, Louisiana, Massachusetts, Michigan, Maryland, Missouri, Ohio and West Virginia.

Tours of the two Lunkenheimer plants — Fairmount, devoted to the manufacture of bronze valves; and Carthage, devoted to the manufacture of iron and steel valves—highlighted the two-day conference

Principal emphasis of the conclave was placed on the use of the Lunkenheimer Guide as a sales tool, the fundamentals of halves and the new 500-page Lunkenheimer catalog.

The conference was under the direction of Melvin W. Pauly, Sales Manager, Eastern and Western Division; and Harold H. Layritz, Sales Manager Central Division.

Southern distributor sales representatives who attended included WILLIAM K. DEPASS, III, and CHARLES E. SMITH, STANDARD SUPPLY & HARDWARE CO., NEW ORLEANS, LA.; J. J. MORAN, ENGLISH BROS., MACHINERY CO., KANSAS CITY, MO.; W. MILNER DONOVAN, R. C. HENTSCHER and A. C. HIEMENZ, DONOVAN IRON AND SUPPLY CO., ST. LOUIS, MO.; J. E. LYNCH, N. E. PETTY, A. J. RAMSEY, and F. H. TAYLOR, MIDWEST PIPING CO., ST. LOUIS, MO.; D. A. MCALLISTER, J. R. BELL and R. C. OSBORNE, BALDWIN SUPPLY CO., CHARLESTON, W. VA.; and G. C. ROOD and M. E. TOMLINSON, BANKS-MILLER SUPPLY CO., HUNTINGTON, W. VA.

Rubarite Plant—Arkansas

RUBARITE, INC., recently opened a new plant at MALVERN, ARKANSAS, for the production of a synthetic rubber powder which is used in rubberized asphalt for road paving and allied purposes.

Rubarite, Inc., is owned jointly by The Goodyear Tire & Rubber Company, The National Lead Company, and Fird & Son, Inc.

First Transformer From General Electric's Rome, Ga., Plant Ordered by Georgia Power

An order for the first transformer to be completed at the GENERAL ELECTRIC COMPANY'S new ROME, GEORGIA, plant has been received from the Georgia Power Company. The 5,000-kva unit is scheduled to be shipped during the first quarter of this year.

Above, J. R. CARMICHAEL, manager of purchases and stores for Georgia Power, presents D. B. LAWTON, manager of the Rome plant, with the purchase order, as J. C. AGER, manager of General Electric's Apparatus Sales Division, Atlanta office, looks on.

The company's multi-million dollar transformer plant is scheduled for completion early in 1954. T. F. VOLKMER is the plant's manager of engineering.

FUTURE EVENTS
Of Engineering Interest

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, H. H. Henline, Sec'y, 33 West 39th St., New York, N. Y.
Jan. 18-22, Winter General Meeting, Statler Hotel, New York, N. Y.

PLANT MAINTENANCE & ENGINEERING SHOW, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.
Jan. 25-28, Exposition, International Amphitheatre, Chicago, Ill.; and Plant Maintenance & Engineering Conference, Hotel Conrad Hilton, Chicago, Ill.

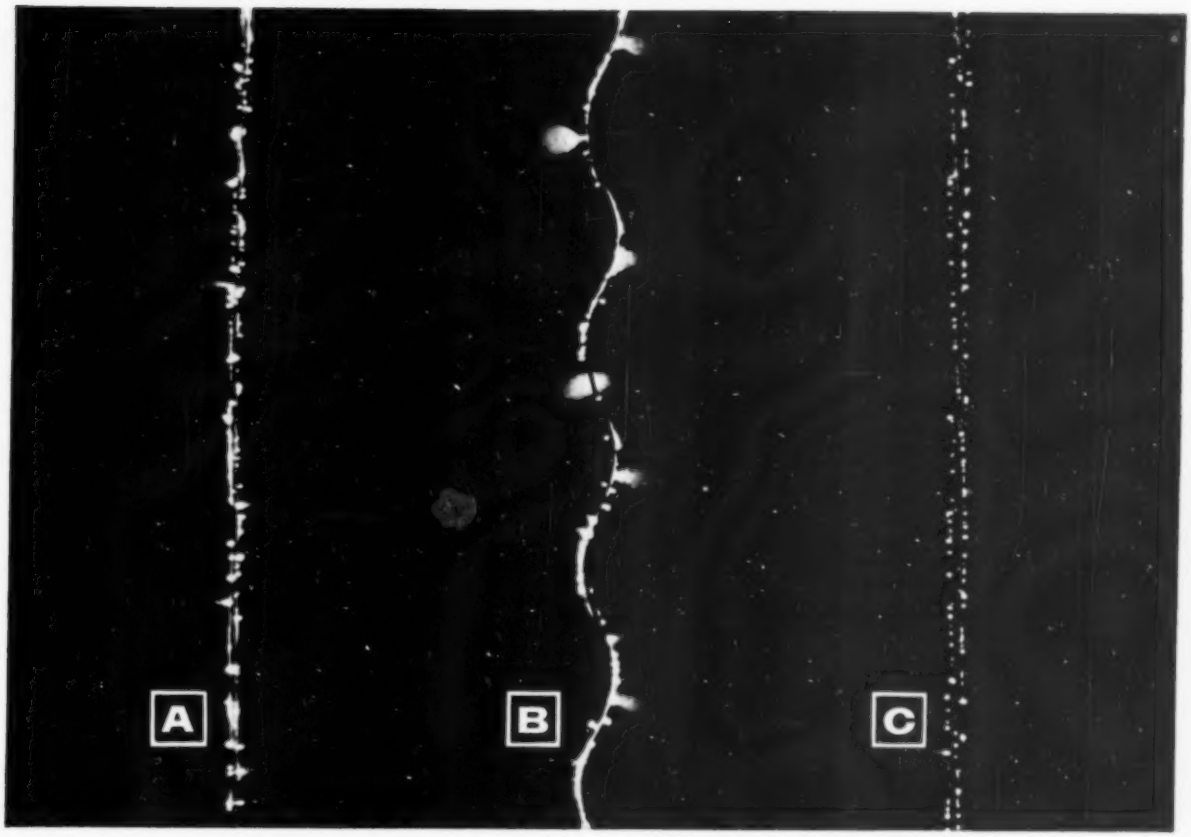
INSTRUMENTATION SYMPOSIUM, Prof. C. D. Holland, Director, Agricultural & Mechanical College of Texas, Chemical Engineering Department, College Station, Texas
Jan. 27-29, Ninth Annual Symposium on "Instrumentation for the Process Industries," Memorial Student Center, Texas A&M College, College Station, Texas.

NATIONAL ASSOCIATION OF PURCHASING AGENTS, W. H. Jones, Chm. Public Utility Buyers' Group, Philadelphia Electric Co., Philadelphia 5, Pa.
Feb. 15-16, Mid-Winter Conference, Public Utility Buyers' Group, Lord Baltimore Hotel, Baltimore, Md.

SOUTHERN SAFETY CONFERENCE AND EXPOSITION, W. L. Groth, Exec. Dir., P. O. Box 8927, Richmond 25, Va.
March 7-9, Fifteenth Annual Conference and Exposition, Kentucky Hotel, Louisville, Ky.

NATIONAL ASSOCIATION OF CORROSION ENGINEERS, A. B. Campbell, Exec. Sec'y, 1061 M&M Bldg., Houston 2, Tex.
March 15-19, Tenth Annual Conference and Exhibition, and Refinery Industry Symposium, Kansas City, Mo.

BASIC MATERIALS EXPOSITION, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.
May 17-20, Basic Materials Exposition and Conference, International Amphitheatre, Chicago, Ill.



The A B C of Electric Precipitation

The efficiency of *any* electric precipitator depends on the quality of the corona emission from the electrode, for it is this emission that 'charges' the dust.

Pictured above are the three most frequently used electrodes for doing this job. You can see the quality of the corona for yourself. We'll be glad to give you an actual demonstration.

Other precipitators use electrodes A and C which give off only fair emission. Use of fine wire (to increase emission) leads to structural weakness. Use of heavy wire (to give strength) means poor emission.

The exclusive Buell Spiralectrode (B) combines strength with peak emission.

The outstanding on-the-job performance of the new Buell Spiralectrode is typical of the advances made by Buell Engineers. Continuous-cycle rapping, for example, proved in service for 20 years has *never* caused "puffing".

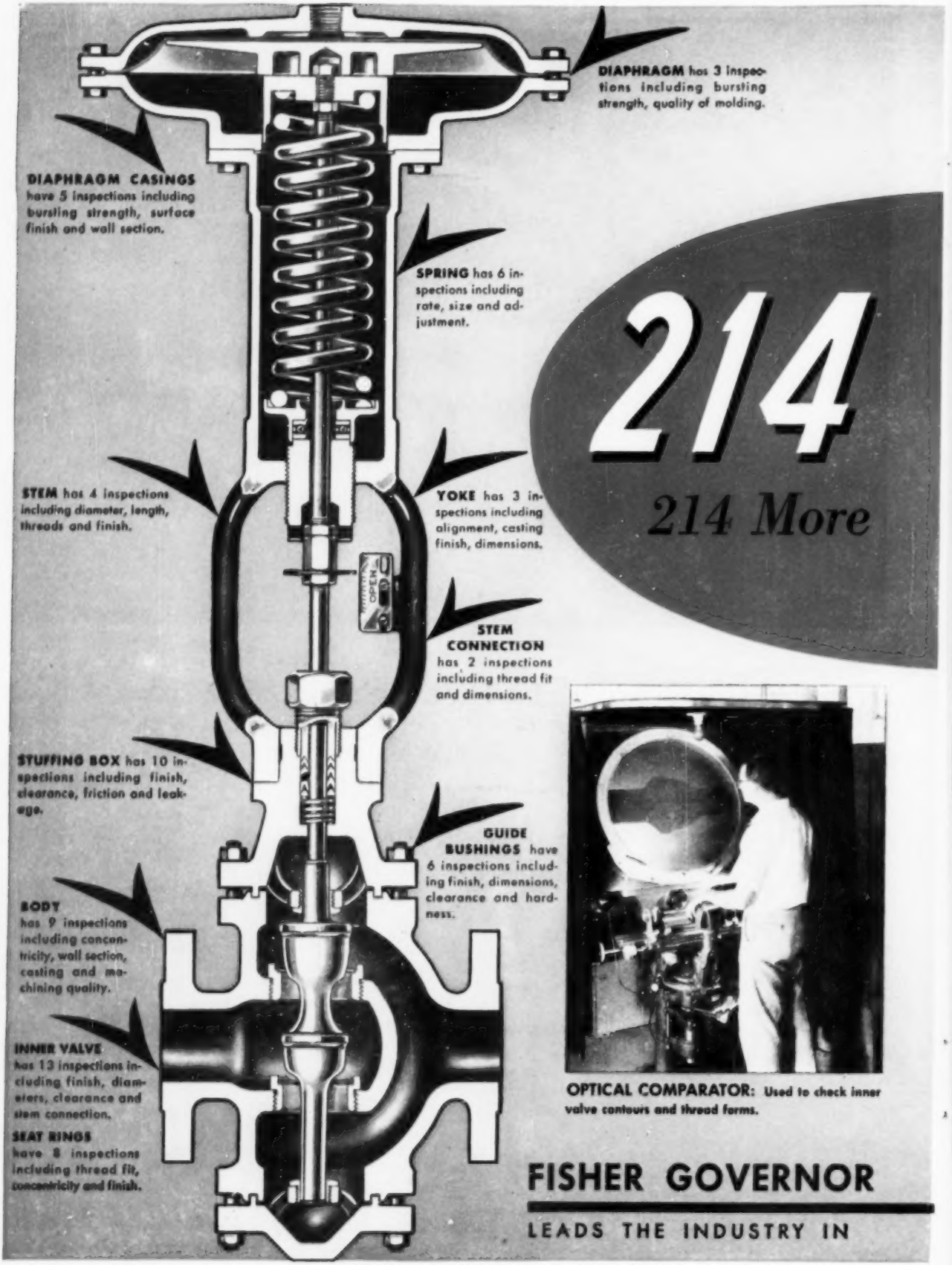
Buell has consistently led the way to greater efficiency, through a long series of technical discoveries and advances, in all types of dust collection.

Get all the facts. Send for our informative brochure—The Collection and Recovery of Industrial Dusts. It explains all three Buell Systems of industrial dust collection. Send for your copy today. Write Dept. 80-A, Buell Engineering Company, 70 Pine Street, New York 5, New York.

buell

MECHANICAL ELECTRICAL

20 Years of Engineered Efficiency in
DUST COLLECTION SYSTEMS


DIAPHRAGM has 3 inspections including bursting strength, quality of molding.
DIAPHRAGM CASINGS have 5 inspections including bursting strength, surface finish and wall section.
SPRING has 6 inspections including rate, size and adjustment.
214
214 More
STEM has 4 inspections including diameter, length, threads and finish.
YOKE has 3 inspections including alignment, casting finish, dimensions.
OPEN
STEM CONNECTION has 2 inspections including thread fit and dimensions.
STUFFING BOX has 10 inspections including finish, clearance, friction and leakage.
GUIDE BUSHINGS have 6 inspections including finish, dimensions, clearance and hardness.
BODY has 9 inspections including concentricity, wall section, casting and machining quality.
INNER VALVE has 13 inspections including finish, diameters, clearance and stem connection.
SEAT RINGS have 8 inspections including thread fit, concentricity and finish.
OPTICAL COMPARATOR: Used to check inner valve contours and thread forms.
FISHER GOVERNOR
LEADS THE INDUSTRY IN

QUALITY CONTROL

FISHER®

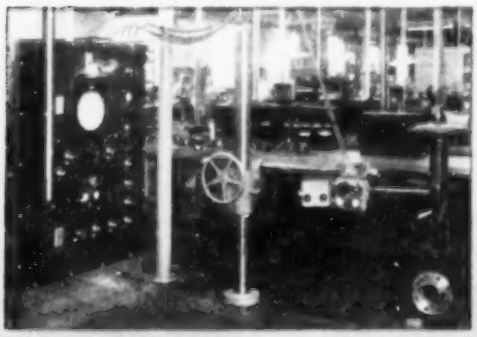
Inspections

Automatic Controllers

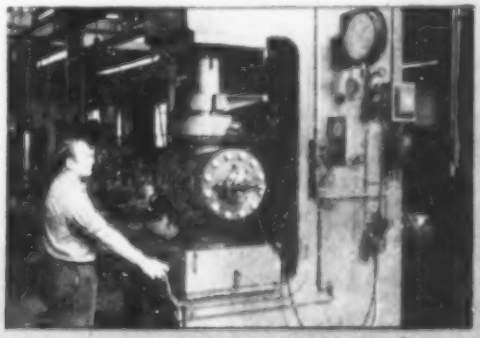
Pressure Regulators — Pump Governors — Liquid Level Controllers — Pilot Operated Regulators — Lever and Float Valves — Intermitters — Gas Regulators — Valve Positioners

Reasons WHY FISHER GIVES YOU MORE FOR YOUR MONEY!

Here at Fisher we believe that *inspection makes perfect.* That's why *every* Fisher Automatic Controller is subjected to an *expert* and *comprehensive* inspection procedure. Typical of this rigid quality control program is the inspection schedule of the Fisher Type 57T diaphragm motor valve illustrated, with a few of the more prominent inspections indicated. From "start to finish", a total of *214 inspections* assures *long trouble-free service* in meeting the most exacting operating requirements. Yes, this Fisher *insistence on perfection* is another example of why Fisher Automatic Controllers always give you *more for your money!*



HYSTERESIS TEST PANEL:
To detect misalignment, friction and check range of operation. Certified test certificates on specification.



HYDROSTATIC TESTING MACHINE:
Hydraulic pressure testing procedure for casting soundness, as prescribed by ASA.

COMPANY • Marshalltown, Iowa

RESEARCH FOR BETTER PRESSURE CONTROL

FISHER

Since 1880

DIXISTEEL TRADE MARK NOW OFFERS

ONE OF THE SOUTH'S LARGEST FACILITIES FOR HOT-DIP GALVANIZING

New Tank Size
4 FT. WIDE
6 FT. DEEP
25 FT. LONG

Double-dipping affords accommodations for pieces up to 45 feet long.

- CASTINGS
- FABRICATED PARTS
- EXPANDED METAL
- PIPE
- TANKS
- STRIP
- BARS
- PLATES

Manufacturers, fabricators, users of steel products: let us give you complete information about these new facilities which have greatly increased our capacity, provided for a more uniform and cleaner job, and made it possible to accommodate items of larger size.

Let us tell you how little it costs to improve the appearance of your steel products and give them years of added life.

Write, wire or phone us today for quotations on this superior service. Please give details about materials, including all dimensions.

OFFICIAL INSIGNIA HOT-DIP GALVANIZING

If it's exposed to rust—hot-dip galvanize it!

FABRICATING DIVISION
Atlantic Steel Company
ATLANTA, GEORGIA • EMERSON 3441

news (continued)

Myers Now Lockheed Plant Engineer

LESLIE D. MYERS, 4162 North Stratford Drive, N. E., Atlanta, has been named plant engineer at the LOCKHEED AIRCRAFT CORPORATION'S GEORGIA DIVISION, at Marietta.

Myers succeeds George Carson, of Marietta, who has resigned to devote full time to his own business, the Carson Machine & Welding Company of Marietta.

Myers is a native of Alexandria, Va., a graduate of V.P.I., and joined Lockheed at Marietta after the reopening of the plant. He has been serving as manufacturing methods engineer.

Westinghouse—Arkansas

Three batch plant silos have been completed for WESTINGHOUSE ELECTRIC CORPORATION at its LAKE CATHERINE, ARKANSAS, plant by The Rust Engineering Company under contract with Frazier-Simplex, Inc.

The reinforced concrete silos, 60 feet high and 30 feet in diameter, will be used for storage of glass component materials such as sand, syenite, soda ash, and cullet.

Silo walls, seven inches thick, were constructed in five days by the sliding form method of concrete construction.

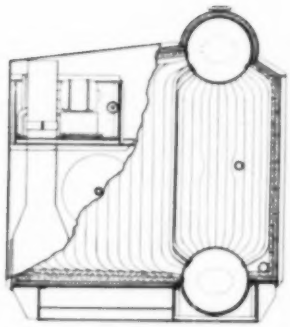
Nat'l Carloading—Sou. Div.

Formation of a Southern Division, with headquarters in ATLANTA, GA., is announced by NATIONAL CARLOADING CORPORATION. The new division is organized to give business firms shipping to and from the South an improved, low-rate forwarder service, especially on long-haul shipments to and from Northern and New England, Western and Pacific Coast points.

Operations of the new Division embrace a wide area. Facilities have been expanded to handle shipments via National Carloading stations located in the following Southern cities: Atlanta, Ga.; Birmingham, Ala.; Chattanooga, and Memphis, Tenn.; Charlotte and Winston-Salem, N. C.; Greenville, S. C.; and Jacksonville, Miami, Tampa and Orlando, Fla.

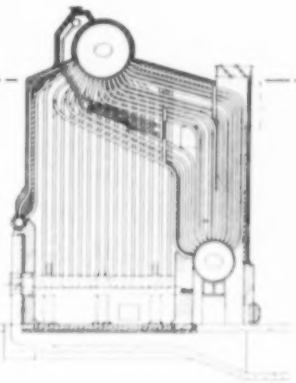
MITCHELL B. MOORE has been named a Vice President of the company and placed in charge of the new division. He will be aided in his duties by HUGH E. COONEY, an Assistant Vice President of the firm.

THE C-E LINE OF STANDARD INDUSTRIAL BOILERS



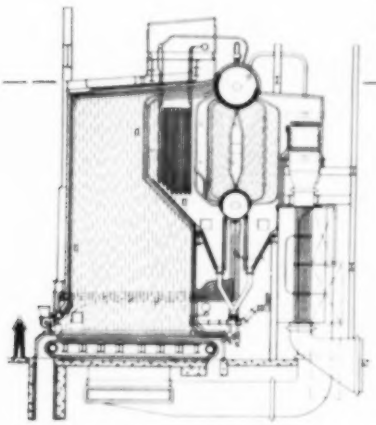
C-E Package Boiler—Type VP – The VP Boiler is designed to meet the demand for compact, standardized units in the medium pressure range. It is shipped completely shop-assembled, with firing equipment, fittings, and forced-draft fan. It is enclosed in a reinforced, welded steel, gas-tight casing. Arranged for pressure firing of oil or gas, the VP will burn either fuel exclusively or alternately. Designed for shipment by rail or truck, its width and height remain constant . . . variations are made in length only. Furnace is fully water-cooled, including burner wall, except in three smallest sizes. Large lower drum permits simple, symmetrical tube arrangement and greater water storage capacity.

Type VP Boiler – from 4,000 to 30,000 lb steam per hr . . . pressure to 250 psi . . . available for either gas or oil firing . . . fully shop-assembled.



C-E Vertical-Unit Boiler—Type VU-10 – Like the Type VP Package Boiler, the VU-10 is designed for plants having a limited number of operating and maintenance personnel. It is designed for industrial load conditions and will operate efficiently over a wide range of output. The boiler is bottom supported and has no outside supporting steel. The same general cross-section arrangement of drums, boiler convection bank, and furnace wall cooling is used when firing oil, gas or coal. Coal firing may be with underfeed, spreader, or chain grate stokers.

Type VU-10 Boiler – from 10,000 to 60,000 lb steam per hr . . . pressure to 475 psi . . . superheat to 200 F . . . suitable for any type of fuel.

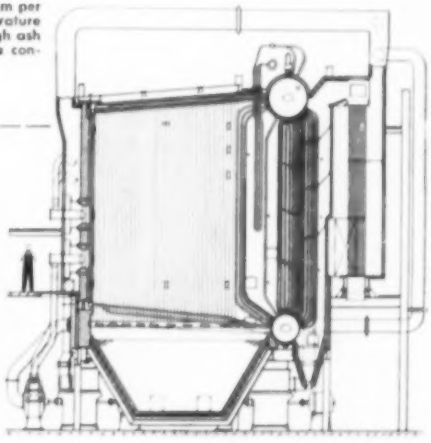


C-E Vertical-Unit Boiler—Type VU-40 – The VU-40 Boiler is a baffleless boiler designed for use with fuels having abrasive qualities in the flue dust. In a baffled boiler using these abrasive fuels, erosion is apt to occur. In the VU-40 Type Boiler, the eroding action of abrasives against boiler tubes and refractory is virtually eliminated. Like the VU-10 and VU-50, this unit is of symmetrical design, providing uniform gas flow and heat absorption across the full width of the boiler.

Type VU-40 Boiler – from 60,000 lb steam per hr up . . . pressure to 1375 psi . . . temperature to 960 F . . . for use with abrasive or high ash content fuel . . . indoor or outdoor type construction.

C-E Vertical-Unit Boiler—Type VU-50 – With the VU-50 Boiler, the average plant can achieve standards of performance closely approaching those of large central power stations. The basic design was originated by Combustion in 1925 and has been widely accepted among steam-power engineers *everywhere*. Because of its symmetrical design the VU-50 provides uniformity of gas flow, water level and steam release across the full width of the unit. It may be fired by pulverized coal as shown opposite or by any other fuel or method of firing. Heat recovery equipment may be added.

Type VU-50 Boiler – from 60,000 to 350,000 lb steam per hr . . . pressure to 1375 psi . . . temperature to 960 F . . . for any fuel or method of firing . . . indoor or outdoor type construction.



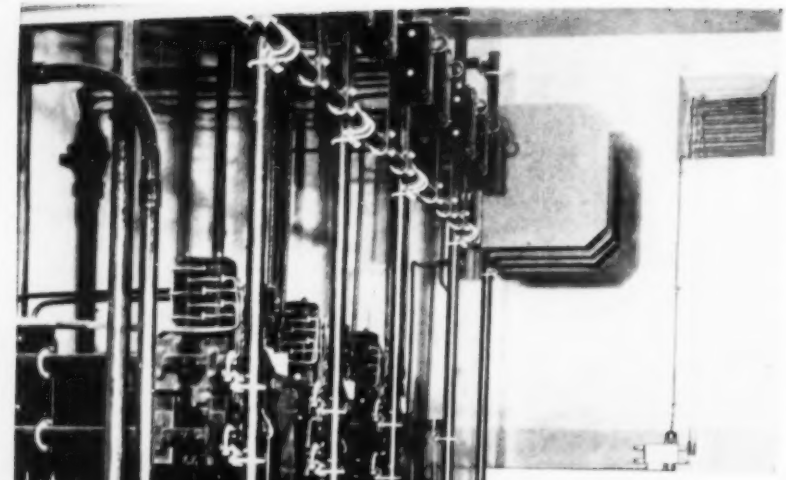
B-691

COMBUSTION ENGINEERING, INC.

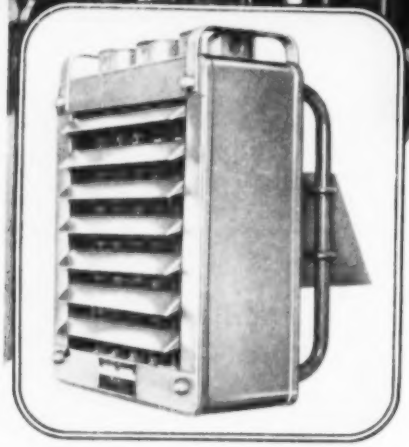
Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT

C-E



The
WING
ELECTRIC
UNIT HEATER
is ideal for locations
like this——
PROTECTION AGAINST
DAMPNESS
AND CORROSION



Here is a familiar problem—an underground substation, unattended, where condensation is likely to occur. The simple solution of the problem is the installation of a Wing Electric Heater (shown at the upper right) which is set in operation by a dewpoint control (shown on the wall below the heater). At the first indication of excess moisture in the air, the dewpoint instrument sets the Wing Electric Heater into operation, heating and recirculating the air in the room and removing all danger of dampness and corrosion.

Wing Electric Heaters have many applications, not only in the electric utility field, but wherever heat is necessary at remote points or where steam or gas is unavailable or uneconomical.

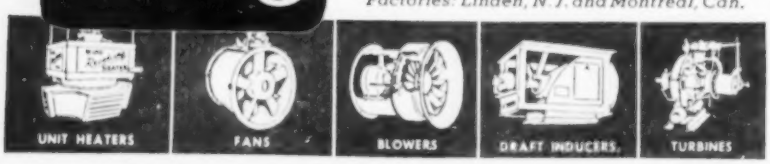
The Wing Electric Unit Heater is made in three types—the Utility Heater shown above, the Wing Revolving Overhead, Downward Discharge Unit Heater and the Wing Electric Duct Heater Section. Sizes from 13,600 Btu hr to 204,000 Btu hr.

Write for a copy of Bulletin E-1

Wing

L. J. Wing Mfg. Co.

169 Vreeland Mills Road
Linden, New Jersey
Factories: Linden, N. J. and Montreal, Can.



news (continued)

J&L Warehouse—Louisville

A new steel warehouse was opened by JONES & LAUGHLIN STEEL CORPORATION in LOUISVILLE, KENTUCKY, early in November.

The company opened another warehouse in NASHVILLE, TENNESSEE, in July.

The new Louisville warehouse will carry a complete stock of hot rolled and cold finished bars, sheets, strip, structurals and plate. With a full inventory, it will stock about 4000 tons of finished steel. The building is a single story structure with 57,500 sq ft of floor space.

A-C Operates Buda Co.

ALLIS-CHALMERS MFG. COMPANY, Milwaukee, Wis., has assumed operation of the Buda Company of Harvey, Ill., which has become a division of Allis-Chalmers. RALPH K. MANGAN, who has been with Buda for 36 years, is in charge of the division, with the title of president and general manager.

Tulane Forms Engineering Research Institute—La.

The formation of an ENGINEERING RESEARCH INSTITUTE at Tulane University, New Orleans, to serve the need of expanding industry of the area, has been announced.

The institute will contract with industrial firms for specific research projects involving practical problems in numerous fields of engineering science. About 20 faculty members of the school of engineering will take part in the work, with physicists, chemists and other specialists from various divisions of the university available as consultants on the projects.

DR. RAYMOND V. BAILEY, head of the department of chemical engineering, was named head of the institute, to work under the general supervision of Dr. Lee H. Johnson, dean of the school of engineering.

Aluminum Smelters Research Institute

C. V. Cooper, president of the Aluminum Research Institute, announces that the name of the association has been changed to ALUMINUM SMELTERS RESEARCH INSTITUTE. Headquarters remain at 20 North Wacker Drive, Chicago, Ill.

SPANG® CW steel pipe helps protect the quality of *Avon* cosmetics

Owner and General Contractor: **Consolidated Realty Investments, Inc., a Ben J. Massell enterprise, Atlanta, Georgia**
Architect: **H. A. Rawlins, Atlanta, Georgia**
Heating Contractor: **Art Plumbing Company, Atlanta, Georgia**

This new, beautiful combination office-and-warehouse in Atlanta, Georgia, is the southeastern distribution point for top quality cosmetics, perfumes and men's fine toiletries produced by Avon Products, Inc. Modern in every respect, Avon's new building was designed for comfort, efficiency and attractiveness.

Cosmetic products are perishable and call for great care in storage. One of the requirements of the new building was a heating system that would provide maximum heat distribution to protect the many types of products in the warehouse from atmospheric damage and low temperatures. Spang CW Steel Pipe was installed to provide lines for the heating system throughout the 62,400-sq. ft. building.

Like the products it serves, Spang CW Steel Pipe is a quality product . . . made on the most modern machines from high-grade skelp, controlled and inspected constantly throughout production and thoroughly tested before shipment. This care in manufacture assures customers of a reliable and high-standard pipe, easy to cut, thread and bend . . . for use in steam, water, gas and air lines and many specialized applications. That's why owners, architects, engineers and contractors who want a quality product specify Spang CW.

Next time you order pipe, tell your local Spang Distributor you want Spang quality-controlled CW Pipe. You'll be glad you did.

SPANG-CHALFANT
DIVISION OF THE NATIONAL SUPPLY COMPANY
General Sales Office: Pittsburgh 30, Pa. District Sales Offices: Atlanta, Boston, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis.

Lick Leaks
with DART Drop-Tight Unions

This True Ball Joint Makes the Difference

QUICK FACTS

- Leakproof because precision-machined to a true ball joint and spherically ground
- Extra wide seats of bronze alloy that resist pitting and corrosion
- Heavy shoulders (Take severe wrenching in stride)
- Nut and Body Practically Indestructible (They are of air-refined, high test malleable iron)

If you *use* Darts, you make a good decision

DART
UNIONS
DART UNION COMPANY • PROVIDENCE 5, RHODE ISLAND
The Fairbanks Co. — Distributors: Boston • New York • Pittsburgh • Rome, Ga.

news (continued)

Acme Steel—Southeast

ACME STEEL COMPANY, Chicago, has announced the appointments of ROY C. CAMP as Southeastern district sales manager and DAN C. JORGENSEN as special sales representative for the Southern area.

Roy C. Camp and Dan C. Jorgensen of the Acme Steel Products' Southern Division.

Mr. Camp replaces Robert Lammers who was transferred to the company's general offices in Chicago as sales manager of Steelstrap. Mr. Jorgensen takes over the duties formerly handled by Mr. Camp. Both men will have headquarters at 1200 Oakleigh Drive, EAST POINT, GEORGIA (suburb of Atlanta).

Mr. Camp came to Acme Steel seven years ago after serving in sales positions with Camp and Eason Inc. and with the Homelite Corporation, Atlanta. He attended the University of Georgia.

Mr. Jorgensen joined Acme Steel eight years ago. He holds a B.S. degree in industrial management from the Georgia Institute of Technology.

Republic Rubber—Houston

STANLEY L. MARTIN has been appointed Field Engineer for the REPUBLIC RUBBER DIVISION, LEE RUBBER AND TIRE CORPORATION, Youngstown, Ohio, with headquarters in HOUSTON, TEXAS.

Mr. Martin will be responsible for contacting the rubber users in the southern part of Texas in the interests of Republic's line of belting, hose and molded and extruded rubber products.

Rockwell Mfg. Co.—Houston

J. N. HOLLAND of 1802 Branard Street, HOUSTON, TEXAS, has been appointed a sales engineer for the Meter and Valve Division of ROCKWELL MANUFACTURING COMPANY covering most of East Texas, according to J. H. WALTERS, Houston district manager.

No wonder "MULTICLONE" is the leading name in the centrifugal recovery of fly ash from all types of gases, hot or cold.

No other mechanical recovery equipment has so many years of fly ash recovery experience behind it . . . or has such uniformly high collecting efficiency . . . or provides so many other money-saving, space-saving advantages as MULTICLONE. The four advantages outlined below are by no means the complete MULTICLONE story, but are typical of the vital savings found *exclusively* in MULTICLONE equipment . . .

In fly ash recovery

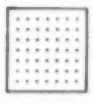
MULTICLONE COLLECTORS

***and only Multiclones* give vital advantages like these...**

Uniformly High Recovery:

MULTICLONE'S multiple *small diameter* tubes—made possible by its exclusive vane design—whirl the dirty gases with greater centrifugal force, thus throwing out not only the large, medium and small particles, but also a high percentage of the *extremely small* particles of 10 microns and less. This, coupled with the fact that there are no pads or filters to become choked with recovered material, results in a more complete recovery of *all* suspended materials from the gas stream.

Long and narrow



Square

Maximum Adaptability:

In addition to its unusual compactness, the MULTICLONE is also unusually adaptable to various installation requirements. Where head room is low it can be installed with side-inlet side-outlet connections. Where side clearances are restricted, it can be installed with side-inlet top-outlet connections. In addition, without changing capacities, the shape of the unit can be varied—long and narrow, short and wide, or square—to fit restricted spaces . . . and its single-inlet single-outlet duct requirements permit greater flexibility and simpler installation. These savings slice installation costs, space requirements and insulating expense.

Space-Saving Compactness:

Plant space costs money—so be sure to check space requirements carefully. As shown in the accompanying chart, the MULTICLONE requires less floor space and less cubic space than any other unit of comparable capacity and performance. Translate these savings into today's high costs for plant space and you readily see the great importance of this one MULTICLONE advantage alone!

Make	Relative Space Requirements In Sq. Ft.	In Cu. Ft.
Multiclone	1.0	1.0
Collector A	2.1	1.8
Collector B	5.9	3.2
Collector C	6.8	3.9

Minimum Maintenance:

The MULTICLONE has no high speed moving parts to repair or replace . . . no pads or filters to clean or renew . . . nothing to choke the gas flow or increase draft losses as suspended materials are recovered. MULTICLONE draft losses remain uniformly low *at all times*. Further, the recovered material from an entire bank of tubes is collected in a *single* hopper—far easier to service and maintain than the multiple hoppers of conventional cyclone units.

FREE INFORMATIVE BOOKLET
This 32 page booklet outlines the basic principles of centrifugal dust recovery and shows the many ways MULTICLONE advantages assure higher recovery at lower overall costs. A free copy of this booklet will gladly be sent on request. Write today!

Before you decide on any recovery equipment be sure to get complete information on MULTICLONE advantages. A letter, wire or phone call to our nearest office places this information in your hands without obligation. Get all the facts and you will get MULTICLONE Collectors!

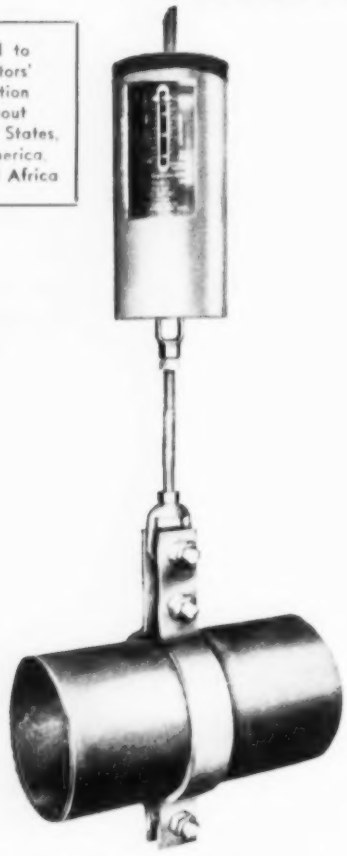
WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1052 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 N. La SALLE ST. BLDG., CHICAGO 2
1429 PEACHTREE ST. N.E., ATLANTA 5 • HOBART BLDG., SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

You'll get easier and less costly installation with reliable **RED TOP PIPE SUPPORT**

Installed to Contractors' Satisfaction Throughout the United States, South America, Europe and Africa



Check these RED TOP features:

4 model sizes cover total load range from 60 to 10,000 pounds, each size having travel range of 3 inches.

Low priced and available immediately from stock.

Easier and less costly to install properly, either as hangers or seats. No turnbuckles required.

Actual load, travel, variability and natural frequency of vibration are all indicated instantly on scale plate for a given pipe position.

Complete engineering and design service available to you through our affiliated company: **UNIVERSAL PIPING, INC.**

Represented by Mr. Ira Pulaski, Suite 1447-2025 Peachtree Street N.E., Atlanta, Ga. Messrs. White & Whitfield, Gulf States Distributing Corp., 4003 Westheimer, Houston 6, Texas. Canadian Affiliate, Unico Piping & Engineering, Ltd., 70 King Street, St. Catharines, Ontario, Canada.

C. H. LEIBFRIED *Manufacturing Corp.*

PIPE SUSPENSION DIVISION
EST. 1885 95-101 GUERNSEY ST., BROOKLYN 22, N. Y.

selects

KIRK and BLUM dust control

"Our feeling was that you could give us better engineering and workmanship . . . we were not disappointed."

E. L. BRUCE CO.,
Memphis, Tennessee

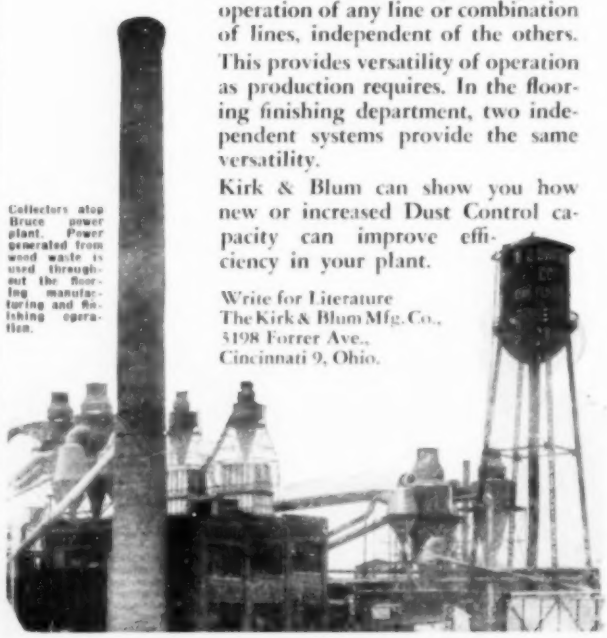
Two of a number of the new, more efficient "Type C" KIRK & BLUM Centrifugal collectors serving this modern woodworking plant.

E. L. Bruce Company, the world's largest manufacturer of hardwood floors, selected KIRK & BLUM to revamp and modernize their dust control system.

In the Bruce plant, Kirk & Blum engineers provided a flexibility and efficiency in operation never before attained. "Unitized" systems permit operation of any line or combination of lines, independent of the others. This provides versatility of operation as production requires. In the flooring finishing department, two independent systems provide the same versatility.

Kirk & Blum can show you how new or increased Dust Control capacity can improve efficiency in your plant.

Write for Literature
The Kirk & Blum Mfg. Co.,
5198 Forrer Ave.,
Cincinnati 9, Ohio.



Collectors atop Bruce power plant. Power generated from wood waste is used throughout the flooring manufacturing and finishing operation.

news (continued)

American MonoRail—Mo.

THE AMERICAN MONORAIL COMPANY announces the appointment of MIDVALE MATERIAL HANDLING EQUIPMENT CO., 5011 Manchester, ST. LOUIS, MISSOURI, as its distributor in approximately half of Missouri and part of Illinois. The account will be handled by TRAVIS W. WINTER.

Midvale also represents YALE & TOWNE, WILSHIRE POWER SWEEPER, and AMERICAN PRESSED STEEL.

SW Research Institute to Publish Technical Calendar

In order to facilitate the exchange of new scientific information, SOUTHWEST RESEARCH INSTITUTE, SAN ANTONIO, TEXAS, is expanding its public service program to include publication of a monthly technical calendar for free distribution to 25,000 scientists and engineers in the region.

In announcing the new publication, Dr. Harold Vagtborg, institute president, appointed Charles E. Balleisen, former supervisor of the nonprofit industrial research institute's engineering mechanics laboratory, to the full-time post of editor of the pamphlet.

Dr. Vagtborg said the publication, whose first issue will appear January 1, will be sent to all members of technical organizations in Louisiana, Oklahoma, Arkansas, New Mexico, Arizona and Texas.

Nuclear Power Study for Newport News Approved

A proposal by the NEWPORT NEWS SHIPBUILDING AND DRY DOCK COMPANY of NEWPORT NEWS, VIRGINIA, for a special study of the application of nuclear power to the propulsion of ships has been approved by the Atomic Energy Commission.

The company developed experience in the nuclear field as a subcontractor on the now terminated project for an aircraft carrier reactor. Six of its engineers recently completed studies at the Oak Ridge, Tenn., School of Reactor Technology.

All costs will be borne by the company. The contract will run for one year after which a complete report of findings and recommendations will be submitted to the Commission. Title to inventions and discoveries and dispositions of reports made in the course of the study will be determined by the Commission.

Okadee
"THE PERFECT SEAL"
WRING FIT

No magic... No magnetism... lapped wring fit of every Okadee Valve disc and seat must pass this test of a perfect sealing surface. (unretouched photo)

... Here's What it Means to You in Terms of Valve Service

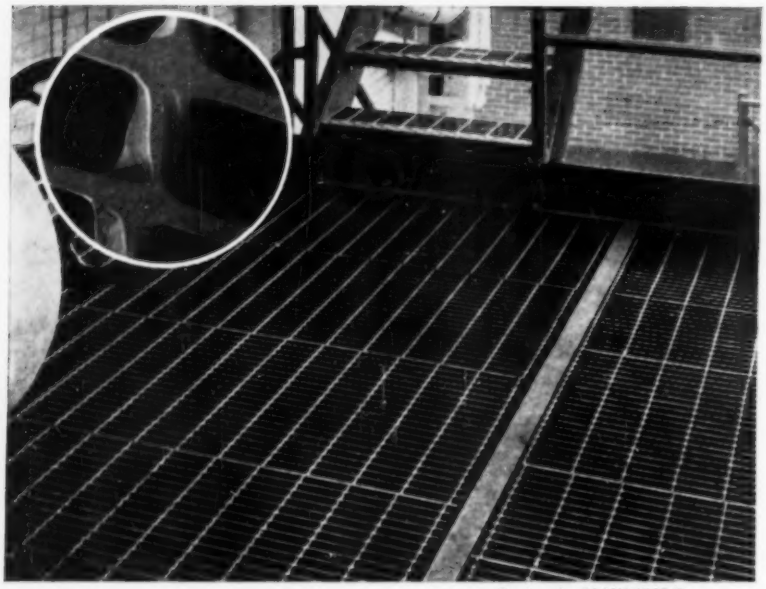
Flat mating surfaces within .000005", or less, of every set of Okadee valve discs and seats mean absolute shut-off of any material from ammonia gas to asphalt.

How long does this seal last in service? We honestly don't know. Tests under working conditions with propane were stopped after 269,000 operating cycles when no wear or seal failure could be detected. And Okadee valves do not have to be babied in service on corrosive or abrasive materials . . . Thousands of boilers have had Okadee blow-down valves in continuous, trouble-free service for fifteen years or more. If Okadee size-pressure-temperature ranges include your valve applications, Okadee installation will end your problems of valve performance once and for all.

Okadee valves are available in single-disc (one direction) and double-disc (two directions) types; screwed or flanged; ½" to 6" in standard A.S.A. dimensions; steel or semi-steel bodies (other materials to order); stainless steel or stellite seat facings; levers, rack-and-lever, worm-gear, hydraulic, pneumatic, automatic on-off control.

Write for Bulletin 332-H today!

OKd. Okadee COMPANY
332 South Michigan Avenue • Chicago 4, Illinois



Grating by BLAW-KNOX

where can **you** use **steel grating?**

You undoubtedly use a lot of steel grating in your plant—floors, platforms, walkways, catwalks and stair treads, for example.

But how about grating for fan guards and shelving—for covering open pits and light wells? And how about other uses throughout your plant that no one has thought of—as steel grating is adaptable to many uses.

If you have any problem about a common application or an unusual application or a possible application, we'll be glad to hear from you. And to give you a prompt answer.

Only Blaw-Knox Electroforged® Steel Grating and Stair Treads —have these five exclusive features:

1. **rigid one-piece construction—easy to install**
2. **all surfaces accessible—easy to paint**
3. **no sharp corners to clog—self-cleaning**
4. **maximum open area—for light and ventilation**
5. **non-slip twisted crossbar—safe footing**

A short note will bring you a copy of new Bulletin No. 2365-R —a dimensional sketch will bring you a quotation.

BLAW-KNOX

BLAW-KNOX COMPANY
2034 Farmers Bank Building • Pittsburgh 22, Pennsylvania

BLAW-KNOX EQUIPMENT DIVISION
GRATING DEPARTMENT

GRATING APPLICATIONS: floors • platforms • walkways • catwalks • stair treads • fan guards • shelving • and many other uses, both outdoors and indoors, for versatile steel grating.

news (continued)

Kauffman Handles Bradford Tools—Baltimore, Md.

KAUFFMAN ELECTRIC CO., 47 W. Oliver St., BALTIMORE 1, MD., headed by J. U. KAUFFMAN, Pres., has been appointed a dealer and service station for the complete line of BRADFORD portable electric tools.

Southern Dealers to Handle Ross Line

CLARK EQUIPMENT COMPANY, Buchanan, Mich., manufacturer of materials handling equipment, has revamped its dealer organization in the South to handle its newly-acquired Ross straddle carriers and fork truck lines.

Dealers affected by the plan are INDUSTRIAL TRUCK SALES AND SERVICE COMPANY, GREENSBORO, N. C.; LUKAS EQUIPMENT COMPANY, COLUMBIA, S. C.; M-H EQUIPMENT COMPANY, BIRMINGHAM, ALA.; DEMPSTER BROTHERS, INC., KNOXVILLE, TENN.; WHITMORE INDUSTRIAL TRUCKS, TAMPA, and EQUIP CO., INC., MIAMI, FLA. Under the new plan Clark dealers will add Ross products to their regular sales and service activities.

Farrell-Cheek, South & SW

FARRELL-CHEEK STEEL CO., SANDUSKY, OHIO, has announced the appointment of HUNLEY A. SLAUGHTER, 1101 Poplar Ave., MEMPHIS 4, TENN., as its representative in the Arkansas-Mississippi territory; and R. C. BROWN COMPANY, 5538 Dyer St., DALLAS 6, TEXAS, for the Dallas area.

Graver Water Conditioning Company—New Orleans, La.

COASTAL ENGINEERING CORPORATION, NEW ORLEANS, LOUISIANA, engineering sales representatives in the New Orleans territory for GRAVER WATER CONDITIONING COMPANY, has been joined by DAVIS E. SPEEG, who will serve manufacturers of industrial equipment.

Mr. Speeg was graduated from Louisiana State University as Chemical Engineer, and has since done considerable work in water treatment for one of the large railroads in Texas. This experience will serve to particular advantage as he will concentrate his activities in the field of industrial water conditioning.

Edward Valves—Houston

EDWARD VALVES, INC., has announced the appointment of REX E. GALLOUP as district manager for the Texas and Gulf Coast area.

Mr. Galloup was formerly sales manager for the Oil Center Tool Company, Houston, Texas. He is a graduate of West Texas State College with a degree in Business Administration. His chief responsibility as district manager will be to direct sales of Edward's new Mudwonder Valve, designed particularly for mudline applications. Mr. Galloup's headquarters will be at 1601 Morst St., Houston.

Leppard Opens Consulting Engineering Office, S. C.

BEN. A. LEPPARD announces the opening of an office at 3 West Plaza (P. O. Box 3294—Station A), GREENVILLE, S. C. Mr. Leppard was formerly with J. P. Stevens & Co., Inc., having been employed eight years in their Central Engineering Department. He had charge of the design, operation, and maintenance of air conditioning facilities in manufacturing areas, offices, and laboratories.

The new office will provide consulting service for new air conditioning installations, both industrial and commercial, as well as alterations and improvements to existing systems where required.

Mr. Leppard is a graduate of Clemson A & M College, a member of ASHVE, Registered Professional Engineer, and member of the National Society of Professional Engineers.

Texas Instruments—Dallas

An electronic opening—with voice energy being sent through a transistorized transmitter-receiver relay and activating a spark gap to sever the traditional ribbon—featured the mid-November open house at TEXAS INSTRUMENTS INCORPORATED, DALLAS, TEXAS.

Speaking to visitors and employees, J. E. JONSSON, president, emphasized the determination of his company "to keep abreast of the latest advances and to participate actively in any important new electronics development."

The plant is contemporary in design and furnishings, is completely air conditioned, and has an area of 150,000 sq ft—of which 90,000 sq ft is new addition.

"Here's My Problem"
CUSTOMER:
First, one of our older buildings has areas which need spot ventilation. Then, in another building, we're going to need large-capacity exhaust to get rid of dust and moisture. Finally, we need additional capacity in an old system where we've just installed some air cleaning equipment. Now, my problem is . . .

Which "Buffalo" Fan Shall I Use?

NV-Breeze

"BUFFALO" REPRESENTATIVE:

To begin with, no single type of fan is the best solution to *all* problems. The best and cheapest answer to your spot ventilation, for instance, is the new Type "NV" Breezo Fan. An efficient propeller fan with strong, rigid, die-formed square panel, the "NV" is simple to install in outside walls wherever you need to exhaust stale air. It can be operated free-air or duct-connected (¼" to ½" s.p.) equally well. The "NV" is made in sizes for 500 to 5500, cfm capacities, and if you need larger capacity, use the new "NV" Heavy-Duty Belt-Air, it's in sizes up to 90,000 cfm.

"Now, for your large-capacity exhaust system, you'll get greatest long-run satisfaction and economy with the new Type "BL" Limit-Load centrifugal fan. It's the type recommended most frequently for large systems — straight ventilation, air washer and air conditioning supply. You can't overload it, and it gives stable performance from shut-off to free air delivery. And you can pick exactly the rated capacity you need, from 1000 to 500,000 cfm, with no waste in an oversize fan or over-specified driving power.

"But where you need to step up the capacity of a system, mount an axial flow fan in a straight portion of your ductwork. The "Buffalo" Axial Flow is light, compact and takes little more space than your duct. It's extremely efficient in straight runs, and has guide vanes to keep turbulence and noise at a minimum. So you see, there is no *one* fan for all jobs. At Buffalo, we make all types and sizes, so that you can pick one that's practically tailored to your particular need. We've been building fans for 77 years, too, which means that you can be sure of any "Buffalo" fans you pick."

SUGGESTION:

and most important of all, remember that Buffalo Engineering Sales Representatives are all technical graduates, factory trained for a number of years; they know fans and their application. Located in all principal cities, they are ready to assist you, too, in fan selection. Why not call on yours today?

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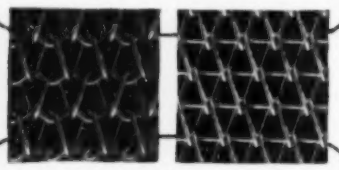
P. S.
IF YOU DON'T USE WIRE MESH BELTS, you'll do well to find out how they can cut costs and boost output by combining product movement with processing in your plant. For information write direct or call in your Cambridge field engineer. Look under "Belting-Mechanical" in your classified telephone directory for the Cambridge man nearest you.



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WHAT'S NEW; Where to Get It

M-1 **CUTTERHEADS & KNIVES**—Bulletin, 19 pages—Illustrates and describes entire line of high speed steel knives, shaper steel, corrugated back knives, round heads, square heads, milled-to-pattern heads, clamp type heads, tenon heads, matcher heads, journal type round heads, shaper heads, milled-to-pattern knives, etc.—DEPENDABLE MACHINE COMPANY, 3400 High Point Road, Greensboro, N. C.

M-2 **OVERHEAD MAINTENANCE**—Lift-A-Loft Bulletin, 4 pages—Tells how the difficulties, hazards and excessive costs of overhead maintenance can be eliminated by use of the "Lift-A-Loft" electric truck, designed to take the maintenance man, with all his tools and supplies, from job to job, and up to the ceiling on its platform for optimum position for the task at hand.—BARRETT-CRAVENS CO., 4609 S. Western Blvd., Chicago 9, Ill.

M-3 **PORTABLE HOISTS**—Bulletin C1, 8 pages—Contains illustrations, descriptions, and specifications for over 100 different types and sizes of portable hoists, including ratchet lever hoists; standard and specialized spur gear hoists; electric hoists; all-purpose Hoist-Alls; Mighty Midget Pullers to hang on a tool belt; and a variety of utility maintenance tools.—COFFING HOIST COMPANY, 800 Walter St., Danville, Ill.

M-4 **GRIPPER SLINGS**—Price & Data Book, 20 pages—Describes gripper woven wire slings for materials handling. Photographs show numerous specific plant applications. Includes strength data, rated load capacities, standard sling fabrics, and other pertinent information.—THE CAMBRIDGE WIRE CLOTH COMPANY, Cambridge, Md.

M-5 **PIPE INSULATION**—Bulletin, "Aluminum-Jacketed Foamglas Pipe Insulation," 2 pages—Describes aluminum wrapped-at-the-factory cellular glass insulation. Illustrates condensed specifications for the insulation of both hot and cold lines.—PITTSBURGH CORNING CORPORATION, One Gateway Center, Pittsburgh 22, Pa.

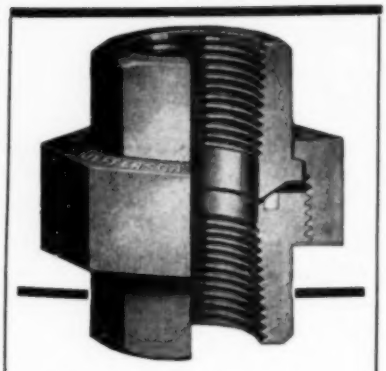
M-6 **SYNCLINAL FILTERS**—Bulletin, 10 pages—Illustrates and describes Marvel synclinal filters for water, including design features, dimensional chart, engineering data, and application. Drawings show actual size mesh recommended for different size openings.—MARVEL ENGINEERING COMPANY, 625 West Jackson Blvd., Chicago 6, Ill.

M-7 **SOLENOID VALVES**—Bulletin W-7, 8 pages—Describes cushioned solenoid operated valves for use in steel mills, rubber plants, waterworks, processing mills, chemical plants, pulp and paper mills, and other industries. Contains operating instructions, and detailed parts lists and dimensions. Illustrated.—GOLDEN-ANDERSON VALVE SPECIALTY CO., 2073 Keenan Bldg., Pittsburgh 22, Pa.

M-8 **DRIPPROOF MOTORS**—Bulletin GEA-6913, 16 pages—Describes maintenance, performance, and protective features of new G-E line of Tri-Clad dripproof type motors. Double-spread cutaway drawing shows components, and photographs of different types with tables of ratings are included.—GENERAL ELECTRIC COMPANY, Schenectady 5, N. Y.

M-9 **WATER SOFTENERS**—Form No. S-105, 8 pages—Information on specification of water softener equipment for any type of plant; data on valves; various sizes of softener units; model numbers; exchange capacities; flow rates; size of units and meters; volume of mineral; amount of salt; shipping weight, etc.—ILLINOIS WATER TREATMENT CO., 840 Cedar St., Rockford, Ill.

M-10 **SUBSTATIONS**—Bulletin 11B6285B, 24 pages—Answers questions relating to selection of load center unit substation to meet specific power requirements; how substations at load centers can improve low voltage caused by heavily loaded feeders; and indoors or outdoors installation. Covers selection of equipment. Illustrated.—ALLIS-CHALMERS MANUFACTURING CO., 954 S. 70th St., Milwaukee, Wis.



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M-11 **DEMINERALIZATION** — Bulletin 5800, 39 pages—Explains treating water by demineralizing it; principles of ion exchange; applications of many anion and cation exchange materials; series of curves for estimates of cost; design and operation.—COCHRANE CORPORATION, 17th St. below Allegheny Ave., Philadelphia 32, Pa.

M-12 **PLANT COMMUNICATION**—Bulletin P-831, 16 pages — Describes power plant communication systems. Photographs show application and operation. Line drawing gives diagram of typical locations of key points.—RADIO CORPORATION OF AMERICA, Sound Products Section, Engineering Products Dept., Camden, N. J.

M-13 **POWER TRANSMISSION PRODUCTS**—Brochure, 8 pages—Sections discuss flexible couplings, variable speed pulleys and transmissions; universal joints; specifications and selection information are included. Illustrated.—LOVEJOY FLEXIBLE COUPLING CO., 4965 West Lake St., Chicago 44, Ill.

M-14 **METAL EXPANSION BELLOWS**—Bulletin No. 300, 6 pages—Describes special type of metal expansion bellows for conveying gas and liquids. Explains welded-diaphragm construction which results in withstanding of high temperature, vibration and corrosion. Other engineering data included, with photographs of equipment.—TITEFLEX, INC., 500 Frelinghuysen Ave., Newark 5, N. J.

M-15 **WIRE ROPE SLINGS** — Folder, "New Ideas in Red-Strand Slings"—Describes new line of multiple part slings and Pin-Lock Thimbles which reduce sling costs by an average of 20%. Also describes new single-part slings equipped with single-swaged fittings, in addition to grommet slings.—LESCHEN WIRE ROPE DIVISION, H. K. Porter Company, Inc., St. Louis 12, Mo.

M-16 **INDUSTRIAL CRANES** — Bulletin CE-3, 24 pages—Describes and illustrates variety of installations of P&H industrial cranes, including different phases of crane production and specifications.—HARNISCHFEGER CORPORATION, Overhead Crane Division, Milwaukee 46, Wis.

M-17 **TRANSVERSE LUBRICATION** — Bulletin 1848, 8 pages—Compares methods for lubricating electric motors. Illustrates three principal types of bearings used in motors and explains function of each. Shows application of Lubriflush.—U. S. ELECTRICAL MOTORS, INC., Box 2958, Los Angeles 54, Calif.

M-18 **SPACE HEATERS** — Bulletin No. 550, 4 pages—Describes "Parallo" oil-fired, warm-air space heater, available in two capacities: 200,000 and 250,000 Btu per hr. Covers special features such as floating stainless steel combustion chamber, high operating efficiency, and flexibility of mounting. Lists applications.—DRAVO CORPORATION, 1202 Dravo Bldg., Pittsburgh 22, Pa.

M-19 **WALL DESLAGGERS** — Bulletin 1016, 4 pages—Shows how dual-motor drive and high striking power are combined to stop water wall slag build-up. Sketches and cut-away views show accessibility for inspection and maintenance.—COPES-VULCAN DIVISION, Continental Foundry and Machine Company, Erie 4, Pa.

M-20 **THREE-DRUM BOILERS**—Catalog SB-49, 8 pages—Describes 3-drum water tube boiler featuring large water holding capacity, fast steaming, large steam relieving surface, and production of superheated steam from standardized design. Illustrated with photographs and drawings.—ERIE CITY IRON WORKS, Erie, Pa.

M-21 **FILTERLESS PURIFIERS**—Bulletin No. 201, 4 pages—Describes Hi-eF Purifiers and their industrial applications, with charts to simplify selection; installation diagrams, tables of dimensions and weights, and equipment photographs.—THE V. D. ANDERSON COMPANY, Purifier Division, 1925 W. 96th St., Cleveland 2, Ohio.

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PORTABLE GROWLER TYPE U-2

This Universal Adjustable Growler may be used as both an external Growler for armatures and an internal Growler for stators. It will test armatures from 2" diameter up, and stators from 5¾" diameter up. Available with or without meter. Six other models.

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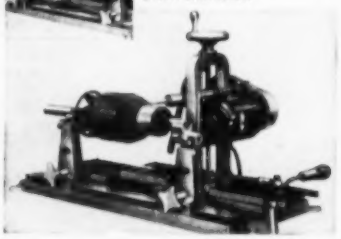
BELOW—Undercutting Horizontal Commutator. Note V-support at right raised to compensate for smaller shaft diameter.



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Books for the Plant Engineer

Cable Accessories Catalog

PUBLISHED BY ANACONDA WIRE & CABLE CO.
25 Broadway, New York 4, N. Y.
Free (see below).

This new cable accessories catalog is a combination of two sections of Anaconda's General Catalog: "Potheads and Terminals," and "Accessories for Wire & Cable," both fully illustrated.

The first half contains pertinent information on potheads, filling compounds, paints and allied items, with discussion of Anaconda pothead features, application and installation data.

The second half deals with joints, connectors, rolling tools, drawbenches, tie wire, armor rods, accessories for ACSR and steel ground wire, and allied items.

Copies of the new Cable Accessories Catalog, C-79-13-14, can be secured by writing direct, on company letterhead, to Fred Luna, Director of Sales Promotion, Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y.

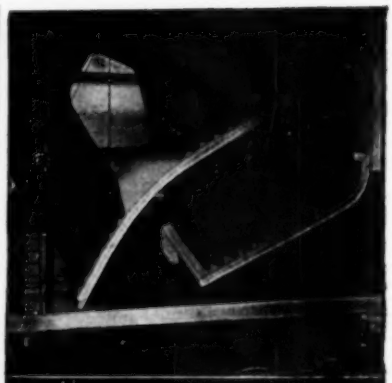
Measurement Techniques

BY R. J. SWEENEY
PUBLISHED BY JOHN WILEY & SONS, INC.
440 Fourth Ave., New York 16, N. Y.
309 pages
Price, $5.50

"Measurement Techniques in Mechanical Engineering" is a practical, compact treatment of the principles and techniques of measurement for the performance testing of power equipment. It provides the necessary theoretical background plus the practical knowledge the engineer needs to select and use measuring instruments effectively.

The discussion of instruments covers their primary function of measurement and indication, and their function as signalling devices to automatic controllers. In presenting methods for high-accuracy measurements referred to calibration from fundamental standards, the author covers the most effective techniques and analyzes their on-the-job practicality.

Don't miss—"Acid Cleaning at 20,000 kw Load"—starts page 52.



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Equipment, Supplies and Methods

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(Starts on page 8)

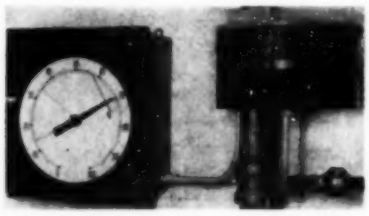
open or closed exhaust. Furnished tapped for either ⅛ or ¼" pipe connections; for use in either air or hydraulic service, pressures to 125 psi, temperatures to 150 F, also in vacuum service.

Recording Turbidimeter

A-8 GENERAL ELECTRIC COMPANY, Special Products Section, Schenectady 5, N. Y., has announced a new recording turbidimeter, which continuously and automatically measures and permanently records the number of particles suspended in liquids.

Developed for use in any process where turbidity is a significant factor, the device can be used with an audible or visible alarm.

Specific applications include chemical and paper plants with private water supplies where turbidity has a direct effect on processes; monitoring of wastes dumped into streams and lakes to guard against pollution; water treatment plants where turbidity of incoming water determines the amount of flocculation chemicals to be added; detection of oil contamination in boiler feedwater; soil erosion studies; and in any process where filter effectiveness must be constantly monitored.



General Electric's turbidimeter and recorder. Theory of operation is that if a liquid has no suspended particles, all light is transmitted while none is scattered so that the ratio of scattered to transmitted light is zero. As turbidity increases more light is scattered, less transmitted, and the ratio increases. The detecting element is a single photovoltaic cell with current output proportional to the amount of light falling upon it. The light ratio is determined by computing the voltage output of the photo cell when scattered light and then transmitted light are successively incident upon it.

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Basic information on the fundamentals of electricity for the first time available in ONE Volume!

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A series of seven articles, "Electricity and Electrical Power" by Roy W. Wages, industrial engineer for Georgia Power Company, was published last year in SOUTHERN POWER AND INDUSTRY and received wide attention and favorable comment from plant engineers in the South and Southwest.

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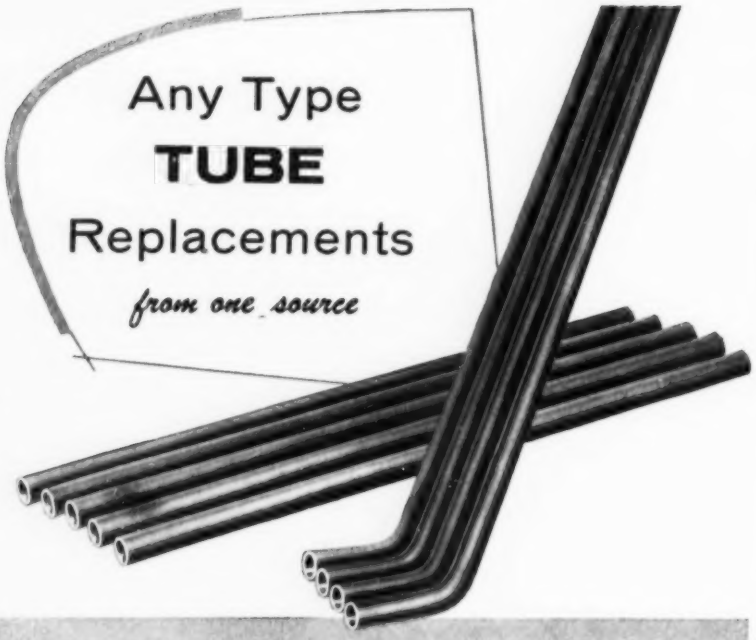

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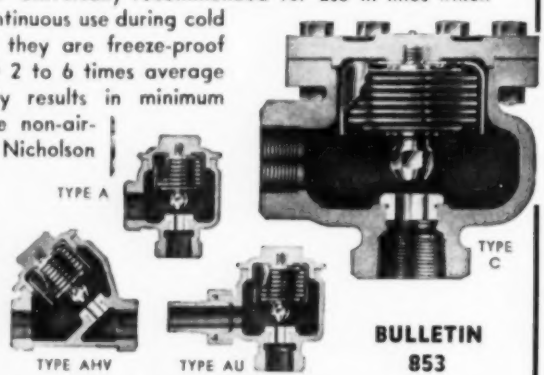
NICHOLSON MAKES

Freeze-Proof Steam Traps

for every Plant Use

Because they drain completely when cold, these four types of Nicholson steam traps are positively freeze-proof. Can be freely installed outdoors. Universally recommended for use in lines which need not be in continuous use during cold weather, because they are freeze-proof and because their 2 to 6 times average drainage capacity results in minimum heat-up time. The non-air-binding feature of Nicholson traps also notably facilitates heat transfer in severe weather. Types for every plant use. Size 1/4" to 2"; pressures to 250 lbs.



BULLETIN 853

175 OREGON ST., WILKES-BARRE, PA.

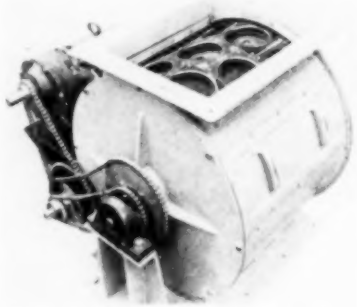
W. H. NICHOLSON & CO.
TRAPS · VALVES · FLOATS

new equipment (continued)

For more data circle item code number on the postage free post card — p. 17

Rotary Feeder Handles Sticky-Flushy Materials

A-9 Richardson Scale Co., Van Houten Ave., Clifton, N. J., has developed a new rotary feeder, which successfully handles exceptionally sticky or flushy materials, including non-corrosive chemicals, feeds, grains, cement, food products and similar materials.



Richardson pocket feeder works like positive displacement pump. Rubber pockets suck in product and eject it forcibly on discharge.

Key design feature is a rubber pocket that increases and decreases in volume when charging and discharging. There are 36 pockets; each one, 5 in. in diameter. These pockets tend to suck in product with a minimum displacement of air, and urge material out at discharge. The machine thus acts like a positive displacement pump.

Outputs range from 300 to 1,000 cfh. The feeder delivers a uniform flow, runs silently, is self-cleaning and completely self-contained. Design is unusually rugged, and there are no delicate parts to get out of adjustment.

In operation, the feeder is attached to the bottom of a bin. Feed drops into the machine and fills the pockets located on the periphery of the feeder's drum. The material is carried around and out the bottom of the machine and delivered to processing equipment.

Protective Coating

A-10 Babbitt Steam Specialty Co., Babbitt Square, New Bedford, Mass., has introduced the new "Formula 67" which seals and protects in one coat.

Surfaces for which the new coating is recommended include metal, wood, glass, brick, unglazed tile, cement, concrete and other masonry. This multi-purpose coating is acid proof, rust resistant, water proof, alkali proof and grease proof. These features make it especially advantageous for use on surfaces that come in contact with or are exposed to corrosive liquids, wear and weather.

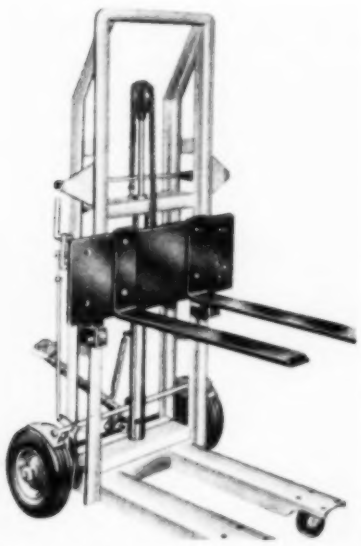
It is easily applied with brush or spray, needs no primer or base coat on properly cleaned surfaces, and needs no after coat. It is said to dry in 20 minutes without dryers, and with no tackiness. Its colors, in a wide range of those most generally demanded, are permanent and will not chalk or fade from the effects of weather.

Portable Lift Truck For One Man Operation

A-11 SAFEWAY INDUSTRIAL EQUIPMENT CORPORATION, 184 North Franklin St., Chicago 6, Ill., announces a new hand model portable lift truck.

This hydraulic lift truck will operate in narrow aisles and turn easily in close quarters. Combination "snap-on" plate permits use as platform truck when forks are not required. Foot lever operation, safety release pedal and wheel lock, permit one man operation with maximum safety.

The units are recommended for materials handling, loading or unloading vehicles, transferring dies or stacking drums and other bulky objects.



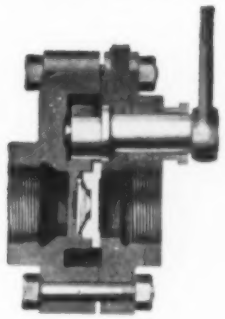
Safeway Industrial Equipment Corporation's 1,000 lb capacity lift truck.

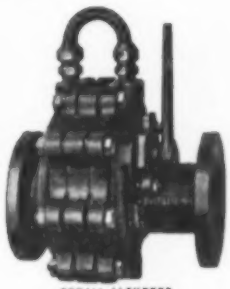
EVERLASTING VALVES

Mean "Everlasting" Protection on these duties

GENERAL SERVICE

Wherever frequent use and quick operation is required for any liquid or gas at pressures up to 300 psi. These valves have outside stuffing box and gland.





STEAM JACKETED

Assure continued free flow of any material which congeals at ordinary temperatures.

FIRE PROTECTION

Closing type for inflammable liquid emergency shut-off, or opening type for deluge or drainage, assuring immediate and positive action with weighted pendulum stop.

BOILER BLOW-OFF

Quick-opening, also hand-wheel operated. Angle and "Y" types and combination units meeting ASME Code requirements for pressures up to 600 psi.

BOILER WATER COLUMN

With indicator and locking device. Meets ASME Code requirements.

EVERLASTING FEATURES

For more than 40 years, EVERLASTING VALVES have been known for their ingenious design, simple, sturdy construction, and long trouble-free life with low maintenance expense. Some of their distinctive features are:

Quick-Action . . . opened or closed with less than a quarter turn of the operating lever.

Straight-Through Flow . . . the disc cannot become loose and accidentally check the flow.

Drop-Tight Seal . . . constant contact of disc and seat at all times prevents dirt or scale from getting between.

Self Regrinding . . . the disc rotates on the seat with each operation, thus regrinding the sealing surfaces.

No Wedge Action . . . all parts move between parallel faces.

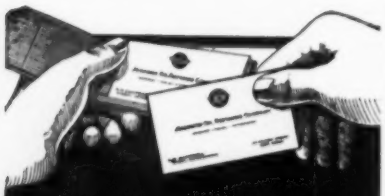
Write for bulletin describing* EVERLASTING VALVES *in detail.

EVERLASTING VALVE COMPANY 53 Fisk Street, Jersey City 5, N. J.

Everlasting Valves

Trade-Mark "EVERLASTING" REG. U.S. PAT. OFF.

for everlasting protection



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A letter from you will bring an assortment of the business cards we have made for others.

THE JOHN B. WIGGINS CO.
636 So. Federal Street, Chicago 5

WIGGINS
Peerless Book Form
CARDS

new equipment (continued)

For more data circle item code number on the postage free post card — p. 17

Protected Metal Roof Deck

A-12 PLASTEEL PRODUCTS CORPORATION, Washington, Pa., has announced a protected metal roof deck for heavy industry.

Plasteel Roof Deck was developed as a practical answer to the need for a superior decking with a built-in vapor barrier—that would permanently resist corrosive influences and high humidity conditions.

This new deck combines the structural strength of steel with three highly protective coatings:—a bond coat; a weather-sealed asphaltic plastic coating; and a pure mineral mica topping. It has a wide application in every field of industry, especially for installations on paper mills, chemical plants and other buildings where corrosion and high humidity conditions prevail.

Panels are 24" wide, which results in greater coverage and takes less man-hours to install. The telescoping ends provide for snug nesting of end laps and give a smooth unbroken roof surface. No metal-to-metal contact is possible. The asphaltic-plastic coating into which the pure mica is embedded under heat seals itself at all joints and eliminates the need for maintenance and periodic painting.

Variable Speed Drive

A-13 REEVES PULLEY COMPANY, Columbus, Indiana, announces new low speeds for its Flexi-Speed Drive, made possible by a new variable speed disc assembly.

Reeves Flexi-Speed Drive is available in ½, ¾ and 1 hp capacities.

The new low speeds make the Flexi-Speed Drive especially adaptable for driving at recommended speeds to practically any gear reducer, either worm or helical. This unit, because of its lower speeds, also is more adaptable to many more applications without reducer.

The latest model of the Flexi-Speed Drive may be mounted in almost any position around the driven equipment, may drive in any direction, and can deliver any desired speed within a ratio of 6:1. The drive also offers the maximum in mounting flexibility. The driven shaft may be located anywhere around the motor shaft, and the speed control handwheel may be located parallel to or in any of eight positions perpendicular to the motor shaft. Six different length belts offer a wide choice of shaft center distances.

industrial equipment company

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Boiler furnaces lined with CARECO last two to four times longer than those lined with fire brick. Write for quotation.

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- WELDING—steel, stainless, aluminum
- FABRICATION—structural, sheet metal
- DESIGN

WHITING PRODUCTS
1000 Mill St. Camden, S. C. Phone 666

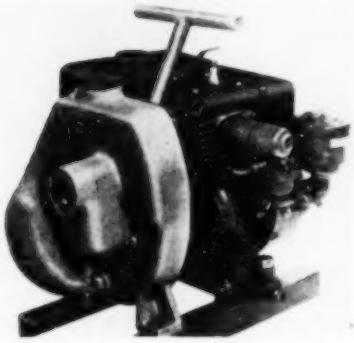
Industrial Wiper

A-13 SCOTT PAPER COMPANY, Chester, Pa., is marketing a new industrial wiper which is said to be clean, strong, safe, and uniform.

The new wiper is highly absorbent, versatile, and convenient. It can be disposed of easily. It is offered in boxes of 125 wipers, with 18 boxes to a case. Each wiper consists of two "Perf-Embossed" sheets welded together for strength and efficiency.

Portable Centrifugal Pump

A-14 KENCO PUMP COMPANY, 1125 North Ridge Road, Lorain, Ohio, is offering a new, handy, portable pump for industrial use—ideal for liquid transfer, fire fighting, dewatering pits and flooded areas.



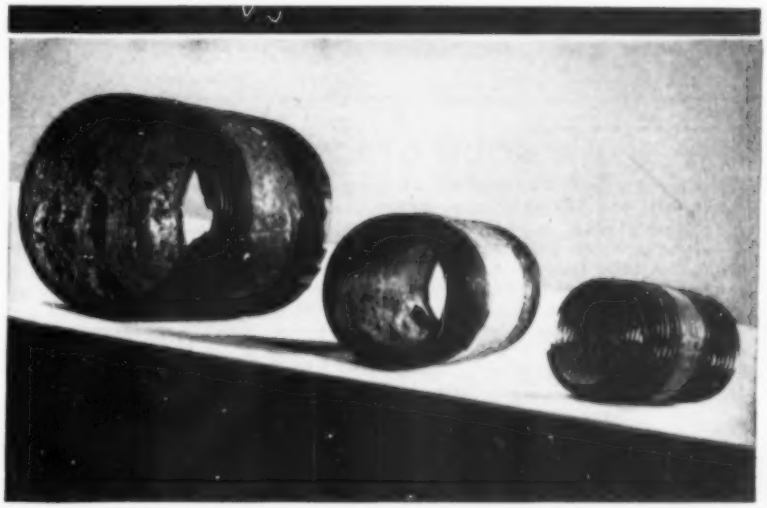
Kenco portable pump weighs only 65 lb. including engine.

The new 114 Portable Pump is completely self-priming, yet has no valves or moving parts other than the motor, pump impeller and seal. It delivers over 100 gpm at lowest head, and is capable of forcing water to a maximum height of 100 ft. High suction lift is assured up to and including 25 ft of lift.

The pump has an open-faced nonclogging type impeller. It will handle all of the solids passed by the Kenco suction strainer affixed to the end of the suction hose. The impeller is positioned on the threaded engine shaft by a spacer, then securely tightened to the shaft.

Intake and discharge connections are tapped for a 1½" pipe thread. A pipe plug is provided for drainage in freezing weather. Pump is powered by the redesigned Briggs & Stratton 1½ hp engine.

STOP CORROSION
with BIRD-ARCHER AMINE TREATMENT



Unretouched photograph shows the ravages of corrosion on condensate return lines.

Corrosion of piping in steam and condensate return lines is an expensive two-way headache. (1) It leads to large outlays for pipe replacement and maintenance. (2) It often results in plugged return lines and traps due to the solid products of corrosion. Bird-Archer Amine Treatment effectively eliminates these troubles at low cost.

Here's how. Amines are fed into the boiler or into the steam and condensate systems. The amines raise the pH value of the condensate and also tend to inhibit equipment-destroying corrosion through surface protection of the metal itself. In scores of plants, this Bird-Archer system has more than paid for itself by substantially cutting replacement and maintenance costs.

Bulletin CP 100 gives all the facts on Bird-Archer Amine Treatment. Write for your copy.

LABORATORIES ENGINEERS · CHEMISTS

BIRD-ARCHER WATER TREATMENT

THE BIRD-ARCHER COMPANY, 4337 NORTH AMERICAN ST., PHILADELPHIA 40, PA.
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Firm _____ Position _____

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BOILERS

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A wire or letter will bring a qualified representative to discuss your problems with you.

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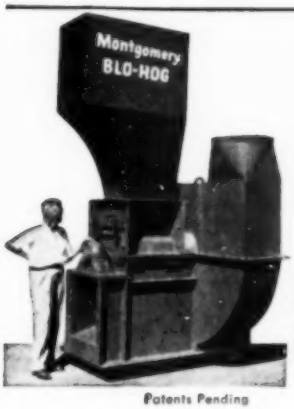

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BLO-HOG

(The only all-purpose hog in the world)

Eats Up Everything!

. . . including Pine, Oak, Gum, Hickory, Elm, Wet Veneer, Round-up and Sandy Bark. Conveyor-fed — no attendant required. Positively protected from major damage by tramp steel. All connections locked — nothing to shake loose. Maintenance costs unbelievably low.

". . . Dear Mr. Montgomery: It is an unbelievable machine and it is still hard to believe that it is actually handling the enormous volume of scrap we are feeding into it. We operate the hog without an attendant —which means a considerable saving. —J. B. Black, Plant Superintendent, Ocala Manufacturing, Ice and Packing Co., Ocala, Fla." C.I.T. Terms Available

Write for bulletin and details

JACKSONVILLE BLOW PIPE CO.

P. O. Box 3687, Jacksonville, Florida

"YOU CAN DEPEND ON

FRICK

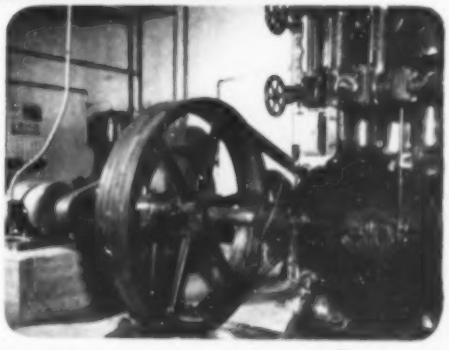
Refrigeration"

Write Sam Vogel and Dave Goldberg, who hold their frozen food storage buildings in Little Rock, Arkansas, at two degrees below zero with four Frick machines. There are two 5 x 5 compressors, plus the two larger ones shown below. Installation by General Refrigeration Co., Frick Distributors at Little Rock.

For the most reliable cooling equipment, using either ammonia, Freon or other refrigerants, look to Frick Company, Waynesboro, Penna.

One of three storage rooms having a total capacity of 3,600,000 lbs. of frozen foods.

Handling a shipment of frozen fruit juice inside one of the storage rooms.



Frick 6x6 and 7x7 compressors in service at the Bird Cold Storage.

DEPENDABLE REFRIGERATION SINCE 1882

FRICK CO.

WAYNESBORO, PENNA. U.S.A.

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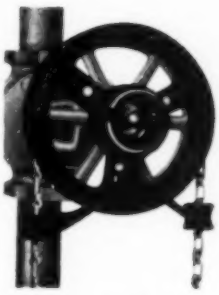
Babbitt
Adjustable
SPROCKET RIM
with Chain Guide

Avoid accidents and costly claims against your company! Operate overhead valves direct from the floor — without ladder climbing, balancing on boilers, standing on workbenches and machines or other risky perches.



Check these outstanding advantages of Babbitt Adjustable Sprocket Rim with Chain Gaide:

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- **Prevents accidents**

Range of 10 adjustable sizes fits all valve wheels from 2 to 30 inches diameter, with rising or non-rising stems. Only four simple parts, quickly-assembled, quickly installed.

Call your Industrial Distributor. He carries complete stocks.
Or write for descriptive folder and prices.

Babbitt STEAM SPECIALTY CO.

3 BABBITT SQUARE, NEW BEDFORD, MASSACHUSETTS

BOILERS

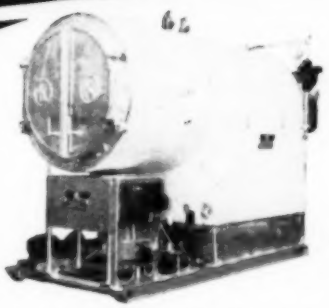

Photo of 60 H.P. Unit Recently Furnished to Cities Service Gas Co.

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10 to 250 H.P. GENERATING UNITS

Mounted on Skids • Easy to Install

Save time and expensive installation costs. Delivered complete . . . these "Package Units" are easily installed . . . ready for water, gas, steam and electrical connections. Built-in Electronic Combustion Controls. A.S.M.E. Code Construction. Pretested and GUARANTEED!

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PEERLESS
BOILER & ENGINEERING CO.
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just *Add* gas!

with WEBSTER'S REVOLUTIONARY

PACKAGED RECTILINEAR* GAS BURNER

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You can fire gas—automatically—through any narrow opening without disturbing your present firing equipment—hand or stoker fired coal, oil or whatever it may be.

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The WEBSTER ENGINEERING COMPANY
TULSA, OKLAHOMA
Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio

the Wilson Way

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virtually eliminates maintenance!

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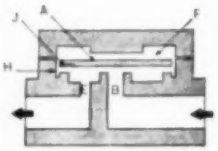
SARCO

Thermodynamic

TRAP



HOW IT WORKS!

Air and/or condensate raise valve seat disc A, discharge thru E. When steam follows, greater velocity causes it to strike body at H thus building up pressure in chamber F. This causes disc to seat, closing tube B. As pressure in F decreases by condensation and leakage thru slot J, pressure in tube B raises disc and cycle is repeated.

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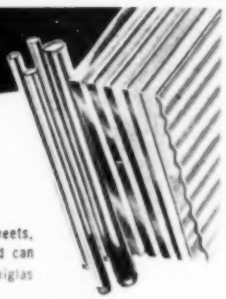

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JENKINS PRACTICAL PIPING LAYOUTS 70

How to plan an INDUSTRIAL WASTE TREATMENT SYSTEM

In many areas, stringent codes have been drawn up to regulate the types and condition of waste which may be discharged into streams and rivers, in order to conserve existing water supply sources.

Industrial discharges usually require chemical treatment, and one of the most common problems encountered is the neutralization of acid waste. In the system shown here, lime is used as the neutralizing agent. The waste normally flows to a digester which allows for settlement of solids and serves as a storage center. Flow from the digester to the treatment tank is regulated by a liquid level controller.

The treatment tank is equipped with an agitator which mixes the waste with the lime slurry to provide a neutral solution. The proportion of lime to be added is determined by a recording pH regulator, which operates the control valve on the slurry line and admits the required amount of slurry for neutralization. The slurry is made by admitting quicklime and water to the lime slurry mixer, which is equipped with an agitator. Emergency lines for direct discharge bypassing the treatment system are indicated in the diagram.

Consultation with accredited piping engineers and contractors is recommended when planning any major piping installation.

Diagram by Huxley Madeheim, Consulting Engineer

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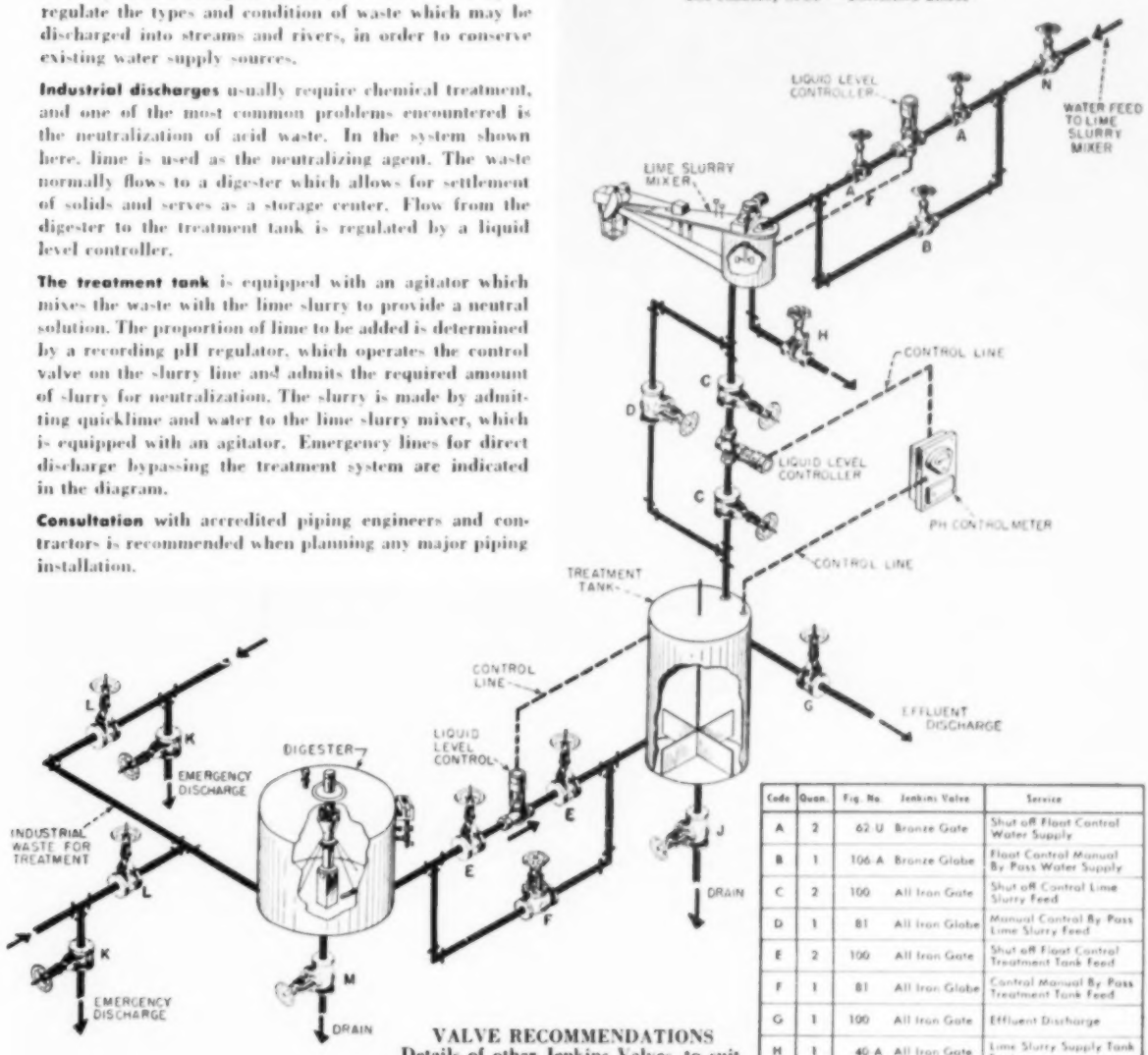

Code	Quan.	Fig. No.	Jenkins Valve	Service
A	2	62 U	Bronze Gate	Shut off Float Control Water Supply
B	1	106 A	Bronze Globe	Float Control Manual By Pass Water Supply
C	2	100	All Iron Gate	Shut off Control Lime Slurry Feed
D	1	81	All Iron Globe	Manual Control By Pass Lime Slurry Feed
E	2	100	All Iron Gate	Shut off Float Control Treatment Tank Feed
F	1	81	All Iron Globe	Control Manual By Pass Treatment Tank Feed
G	1	100	All Iron Gate	Effluent Discharge
H	1	40 A	All Iron Gate	Lime Slurry Supply Tank Drain
J	1	81	All Iron Gate	Treatment Tank Drain
K	4	100	All Iron Gate	Emergency Waste Discharge
L	4	100	All Iron Gate	Shut off Waste Lines
M	1	81	All Iron Globe	Digester Drain

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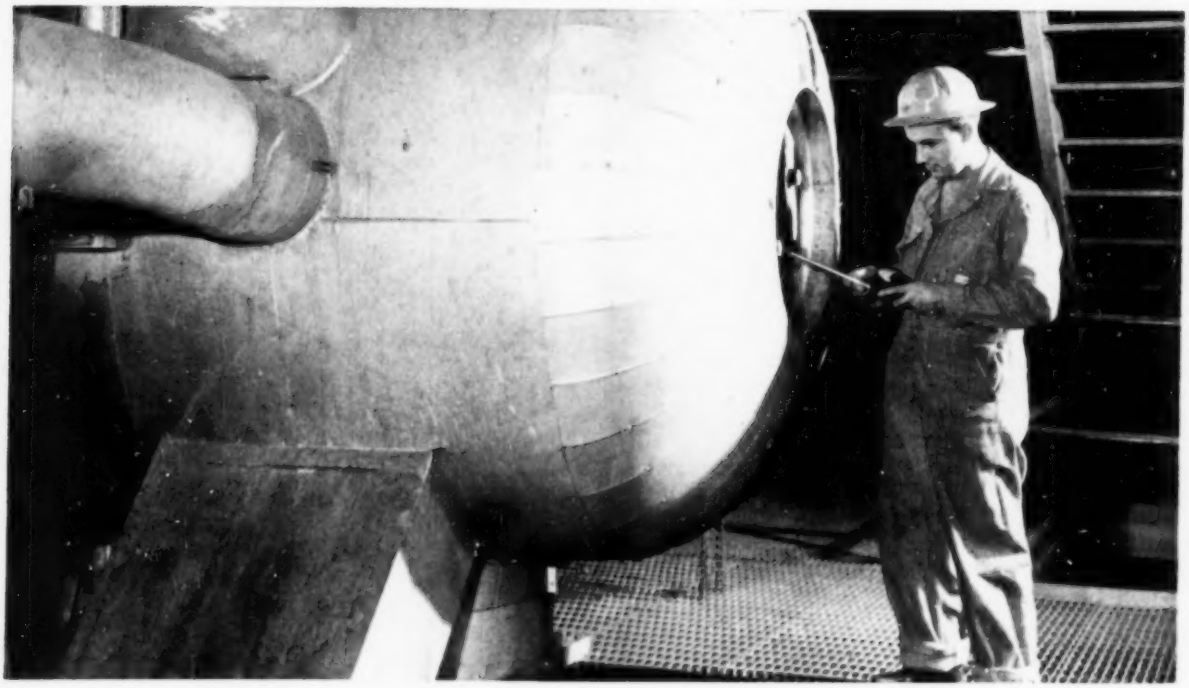

Perhaps the most convincing way of demonstrating the advantages of one method of cleaning over another is to conduct a comparative test.

That's exactly what one of the larger utility companies did to compare chemical cleaning with mechanical cleaning. The 23-day test was conducted with companion boilers, rated at 200,000 lb. per hour operating at 500 p.s.i. One boiler was chemically cleaned by Dowell in 12 hours, the other was turbined in one week.

At the conclusion of the test, the boiler which was chemically cleaned by Dowell had a 4.5% greater efficiency factor. It also used 10% less coal per KWH gross produced than the other boiler. With results like this to cite, it's no wonder leading plants in all parts of the country rely on Dowell service for their maintenance cleaning.

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